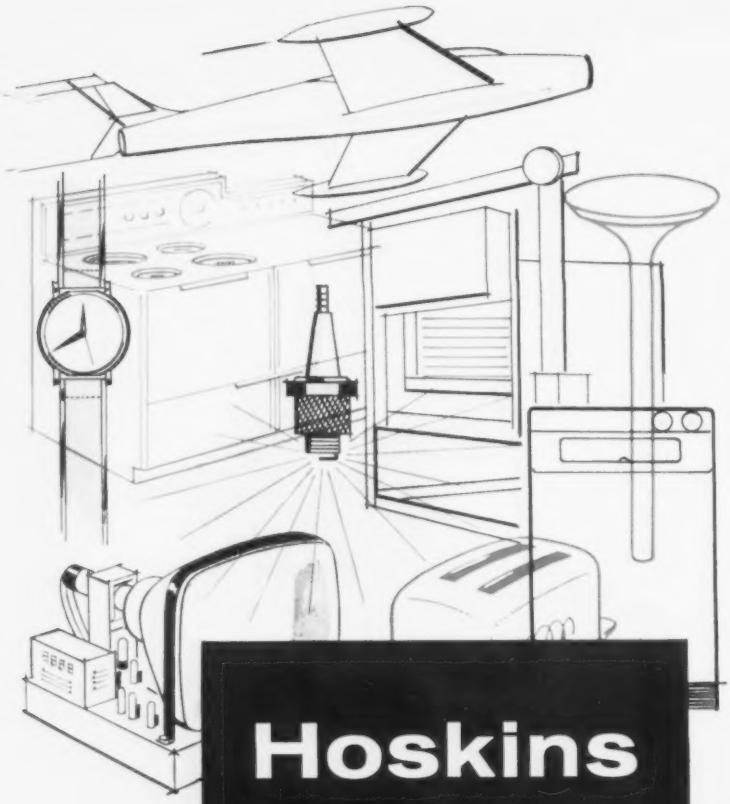
The IRON AGE
March 21, 1957
The National Metalworking Weekly

Organic Finishes: Their Selection, Use And Control P.107

Are Steel Users Hedging Against Prices? – P. 59

How Labor Presses Its Case in Washington – P. 62

Digest of the Week P.2-3



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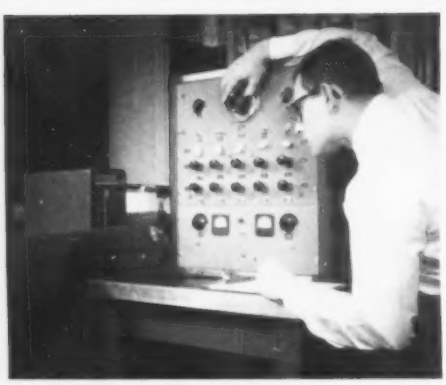

Only one of its kind – Designed and built by Hoskins, this special instrument provides accurate means of measuring temperature coefficient of resistor wire and ribbon. As part of our complete metallurgical research and development facilities, it is one more reason why you should "look to Hoskins first for the finest in quality controlled alloys!"

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The Olympian Dredging Company of San Francisco laid these problems on the table when they planned the construction of a new 7½-yd dredging bucket. The 10-ton clamshell shown above is the end product of their thinking.

The bucket was fabricated from 1½- and 2-in. plates of Mayari R high-strength, corrosion-resisting steel, with all wearing parts hard-faced for additional life. Although the bucket measures 7 ft wide by 9½ ft long, giving it 50 pct greater capacity than the Bay region average, its deadweight is moderate because Mayari R's high strength permits designing in lighter sections.

If you have a problem where resistance to corrosion or abrasion, weight-reduction or superior strength are critical matters, perhaps Mayari R would prove to be the practical, economical solution. Our Catalog 353 is full of just such examples in a wide variety of applications. A copy is readily available through the nearest Bethlehem office.

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The IRON AGE

Mar. 21, 1957—Vol. 179, No. 12

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NEWS DEVELOPMENTS

Are Steel Users Hedging Against Higher Steel Prices?

Purchasing agents say they are not. But overall inventories are

heading toward a summer peak. Outlook for continued labor peace alters sentiment for inventory building. **P. 59**

Labor Concentrates Strength In Capital

Bad publicity in Senate hearings has hurt labor. Supreme Court decision also hits labor's political activity. Labor still intends to concentrate on legislative front at national and state level. UAW's activities are labor blueprint. **P. 62**

How Industry Sees The Atomic Power Foul-Up

Criticism triggered by Admiral Rickover that U. S. industry is laying down on the nuclear power job brings strong protests. Technical problems are cited. If the government wants a speedup, some say, it will have to spend more for atomic research. **P. 64**

Metalworking

SPRAY SETUP: Clean, well-lighted layout helps do a better job of spray-coating assemblies on this conveyor line (photo courtesy of The Glidden Co.). Many more suggestions for improving organic coating operations are included in this week's feature article. **P. 107**

Steel Founders Feel Inventory Cuts

Overall business is good for steel castings. But many are feeling the pinch. Answer is in inventory cutbacks among many customers. April should see worst over, with demand picking up into second half of the year. **P. 65**

FEATURE ARTICLE

HOW TO GET MORE FROM ORGANIC FINISHING

Virtually every organic finishing material must be "engineered" to give top performance for a specific

end use. An infinite number of factors affect organic finishes, from manufacturer through to application. **P. 107**

Good Finishes Begin With a System

Most industrial users are buying a finishing system, material performance, and service along with a finishing material. Getting a satisfactory dry paint film calls for compromising many variables. **P. 108**

Economical Ways to Get Better Finishes

A well-formulated material helps, but it's dry film appearance and performance you're shooting for. Improper temperatures, for instance, can cause you to spray away up to 60¢ of every dollar spent for materials. **P. 112**

Keep Quality in Line By Control

Good paint, good application, consistent results. Achieve all these and your organic finish problems are licked. Here's a rundown of uniformity, viscosity, other tests for controlling finish quality. **P. 117**

MARKETS & PRICES

Powder-Actuated Tools Put Kick In Fastener Sales

Powder-actuating fastener makers sold $6.9 million worth in 1956, an all-time high. But record won't stand long. They expect to fracture it this year with whopping $9.5 million sales. **P. 68**

Will Wolfson Take Over American Motors Corp.?

Louis Wolfson is now AMC's largest shareholder. For the time being he is not making any attempt to get control of the company. But some of his ideas clash with those of President George Romney. **P. 76**

Capitol Is Split on Atomic Energy Issue

Some leading Democrats in Congress are demanding that the government reclaim the atomic energy development program. Private industry, they claim, is exceeding the budget. **P. 81**

Retired Executives Serve As Consultants

Former management men don't fade away in Calif. They're too busy serving as advisors to smaller firms. Here's a rundown on a service metals firms find valuable. **P. 83**

Dip in Sheet and Strip Sales Obscures Upturn Elsewhere

There's no denying that sheet and strip sales are off. But there's some good news, too. An upturn in plate, structurals, and pipe, for example. **P. 143**

NEXT WEEK

Improve Quality Control And Cut Costs

Most production men will agree that effective quality control is a must for profitable operation. Next week's cover story offers some basic pointers for building an "in-plant scrap charging system."

STAINLESS STEELS AND CORROSION RESISTANCE

The best stainless steel tubing for a specific application cannot be identified by surface appearance alone. The answer is found in the grain structure because the corrosion resistance of any given grade of stainless steel depends on heat treatment.

And constant testing is the only way to prove a material's ability to beat the many different types of corrosive attack . . . as B&W men like Mike Landman, who checks corrosion resistance of B&W Stainless Tubing, know. And the entire team of B&W technicians—inspectors, furnace operators, metallurgists, engineers and chemists—know that constant checking is an integral part of the complete production cycle.

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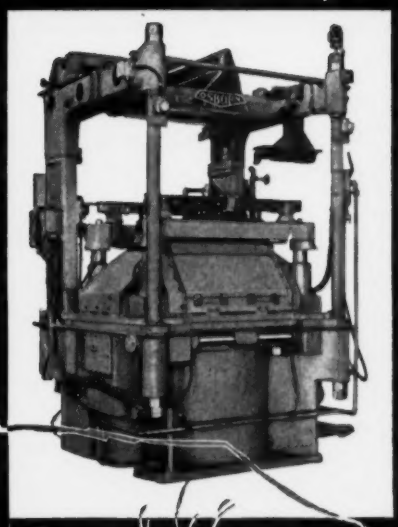

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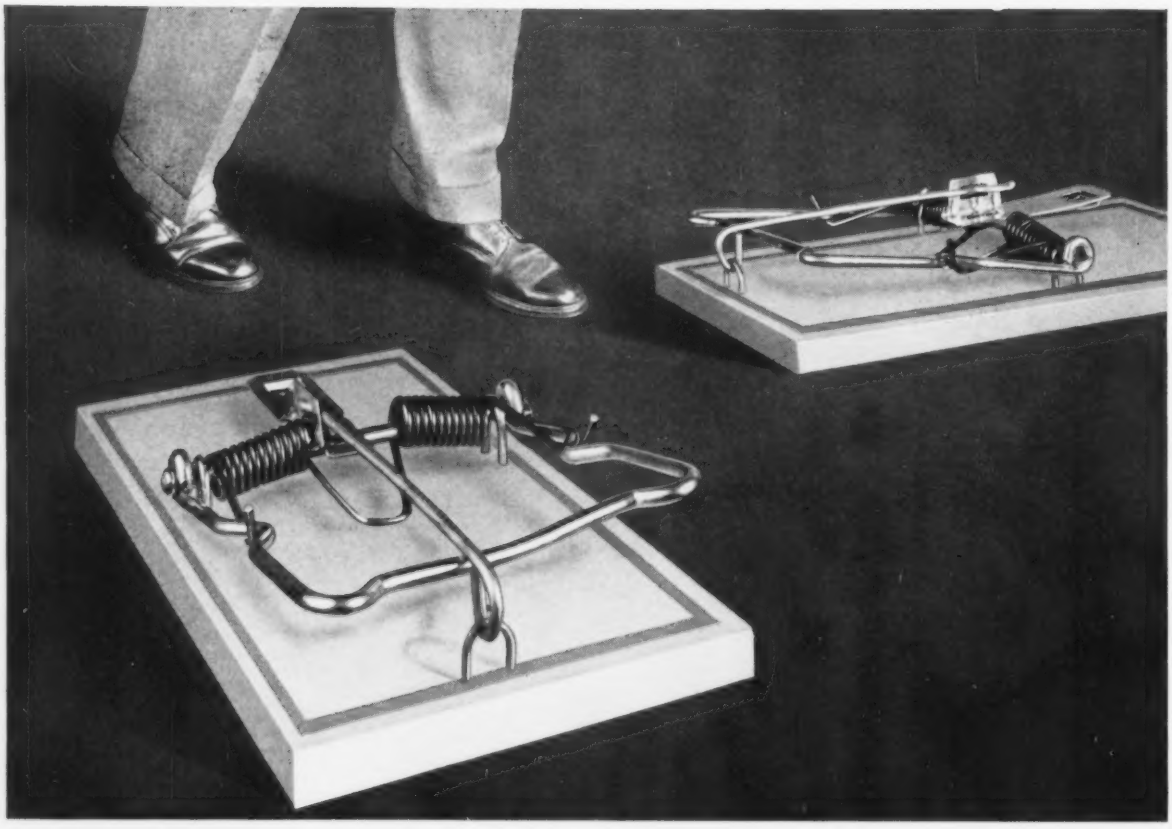

Two traps to avoid in today's sheet steel market

A sudden switch from feast to famine in the supply of sheet steel is a good possibility. So says Iron Age Magazine and other authorities who point to the likelihood of stepped-up demands from auto makers this spring as one reason for expecting a change.

This possibility creates two buying traps for *all* sheet and strip users!

One trap is "hand-to-mouth buying." It looks safe today—but it's a dangerous way of life, because you might be pressed to meet production demands if supply should tighten overnight.

The second trap—"loading up now at current prices—while quantity buying is easy." The hitch here, of course, is that what looks like a bargain may prove costly. You tie up needed capital—incur extra costs for storage, handling, insurance, taxes and possible damage or obsolescence. All this must be added to the cost of the steel—as much as 16.5%, or more, according to sharp-pencil purchasing experience.

How can you steer clear of these traps? Here's what many buyers who have learned the hard way advise:

1. Establish a steady buying pattern with a source such as Ryerson—whose stocks and resources afford maximum protection during times of short steel supply.
2. Estimate your requirements for a few months ahead. Then ask Ryerson to work out a schedule of steel shipments to be delivered as you need them.

So right now is the time to talk to your Ryerson sheet and strip specialist. He will be glad to review your requirements with you and work out a plan tailored to your needs.

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There's No Sell Like the Hard Sell

Harry was decrying the way some people sell. He was peeved at the general talk about business being bad. Everyone he talked to thought business generally was bad—but not with them. Harry is a grade A No. 1 salesman.

We got to talking about sales tools. Harry agreed that they were needed. Facts, figures, technical data and performance helped, he said.

He volunteered that now-a-days the salesman got better treatment in offices or reception rooms than ever before. Recently he spied a sign that said to check with the girl if you did not see your man in ten minutes.

We got into a hassle about different kinds of salesmen. That didn't last long; we conceded that no two salesmen are alike. At least that's what salesmen say.

Then we got on the subject of calls. Harry believes some salesmen are cry-babies. They don't make enough calls, he said. How many should they make, we asked. Admitting that each man has his own problems, Harry said he carved out 12 calls a day.

Getting off on the wrong foot, we asked what happened when he saw only four or five people. The only excuses he accepted were when seven or eight of those on the list weren't in, broke a leg or the plant had burned down.

Naturally we wanted to know if Harry made that many calls. He did. And the ones he made were the type that build up new customers. The regular customers are taken care of. But—and this was a lulu—if, after so many days, one of Harry's customers doesn't come back with a repeat order he is "open territory," fair game for any other salesman in the company.

Of course it is true that everyone can't make 12 calls a day. It depends on the territory, the time it takes to sell and distance between plants. But his point was that you couldn't sell ice cream on the equator unless you made calls.

We had a sidebar conference on planning. One wag—looking over our shoulders—argued that too much time in the office deciding whom to see instead of going out and seeing him was for the birds.

We touched on entertainment. Harry said that if it pays off, do it; if not, skip it. He meant skip perennial free-loaders.

The gist: The old way of selling is still good. It means hard work, calls, recalls, using your head, playing by ear—and using the sales tools.

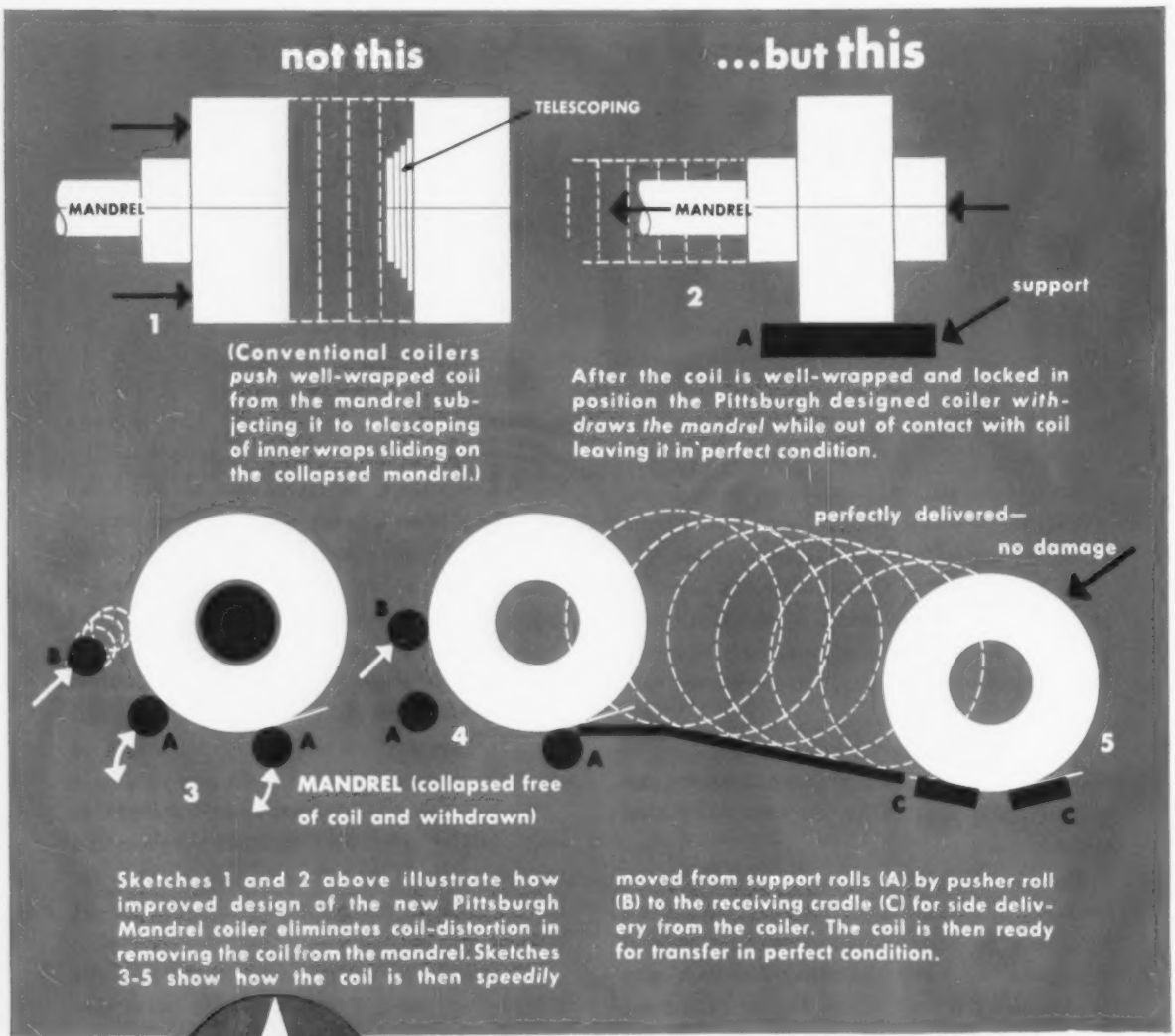
Tom Campbell

Editor-in-Chief

New hot strip coiler

by Pittsburgh

Delivers each coil in perfect condition


not this
...but this
TELESCOPING
MANDREL
1
2
support
A
(Conventional coilers *push* well-wrapped coil from the mandrel subjecting it to telescoping of inner wraps sliding on the collapsed mandrel.)
After the coil is well-wrapped and locked in position the Pittsburgh designed coiler *withdraws the mandrel* while out of contact with coil leaving it in perfect condition.
perfectly delivered—
no damage
B
A
3
4
5
C
MANDREL (collapsed free of coil and withdrawn)
Sketches 1 and 2 above illustrate how improved design of the new Pittsburgh Mandrel coiler eliminates coil-distortion in removing the coil from the mandrel. Sketches 3-5 show how the coil is then *speedily* moved from support rolls (A) by pusher roll (B) to the receiving cradle (C) for side delivery from the coiler. The coil is then ready for transfer in perfect condition.

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LETTERS FROM READERS

Research Pays Off

Sir—We have just read the article entitled "Plan Ahead to Make Research Effort Pay Dividends," in your Mar. 7 issue. It is a mighty fine article and we would like to distribute copies of it among our technical staff and company officers. May we have twelve reprints of this article? **W. T. Elston, Technical Staff Mgr., Speer Carbon Co., Saint Marys, Pa.**

Copies are on the way.—Ed.

Computer Service

Sir—We were very interested to note the article, by J. J. Obrzut, titled "Where Computers Fit in Metal Working," in your Jan. 17 issue. However, we were greatly disappointed that the name of our company was not included either in the text or in the list of those companies offering computer service.

We offer a complete digital computing service at our Los Angeles office. These facilities are available to the industry of the West. Analysis and programming service will be available as well as machine time. **W. J. McGuckin, Adv. Mgr., Bendix Computer Div., Bendix Aviation Corp., Los Angeles, Calif.**

Aluminum Dollar

Sir—I just ran through your special feature, "How to Get More for Your Aluminum Dollar," in the Jan. 31 issue. It is a good piece and I would surely appreciate receiving a half-dozen reprints, if they are available. **E. J. Rockey, Aluminum Co. of America, New York, N. Y.**

Vacuum Diecasting

Sir—On p. 33 of the Feb. 28 issue a short article describes vacuum diecasting of aluminum on a production basis, in a cold chamber machine in which the castings: (1) Are as dense as forgings, (2) Offer mechanical properties much superior to conventional diecast parts, (3) Can be anodized as easily as sheet or extruded aluminum.

Can you tell us who is now producing these castings and whose machine is being used? **C. C. Cohn, Colonial Stove Co., Phila., Pa.**

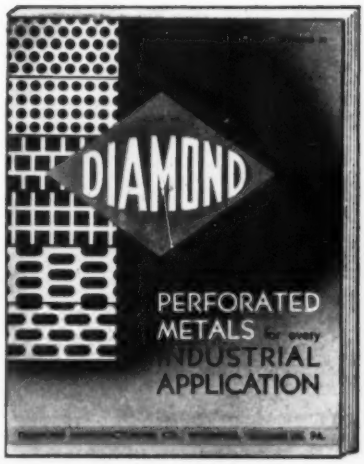
For more information write the Nelmor Mfg. Corp., 26420 Lakeland Blvd., Euclid, Ohio.—Ed.

Service Manuals

Sir—We have recently read your article "Service Manuals Need Improving" on the machine tool page in the Feb. 7 issue of THE IRON AGE. Needless to say, we are very pleased to receive the good publicity which you have given to our National Machine Tool Builders Assoc. by showing that we are attempting to provide better service literature for our customers.

We feel the NMTBA's 1956 advertising competition for the best service literature provided our members with much useful information about service literature, and we certainly appreciate your publicizing the results. **R. A. McCleneghan, Adv. Mgr., Barber-Colman Co., Rockford, Ill.**

"It's a new wage formula, chief . . . it's a raise based on what my wife spends instead of what I earn."



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FATIGUE CRACKS

Organic Finishes

There's quite a bit more to selecting an organic finish than buying a can of paint from a corner hardware store. And applying them properly is even more complex.

This week's "Metalworking Dollar" feature on organic finishing digs into both problems. It suggests ways of selecting an "engineered" coating; then tells how to apply it most economically.

Performance Checks—Along with these practical guides for better finishing, the feature starting on p. 107 also takes up methods for checking production line performance and finishing quality.

If you're unaware of just how important organic finishes are to metalworking, we'd also like to point out that sales of organic finishes topped $1.5 billion last year. Of this some $630 million went into coatings for commercial and industrial products.

Pulsetaking

To learn whether steel users were stocking up in anticipation of a price boost in July, IRON AGE district editors buttonholed purchasing agents the country over.

What they found shaped up into a revealing commentary on the thinking of steel buyers on the question of price hedging versus cost of warehousing. The long-term contract in steel is a factor.

It's all wrapped up in a neat package beginning on page 59.

Puzzlers

The Butcher, the Baker, the Candlestick Maker and the Chorus Girl Puzzler works out about like this: Butcher, Sr. was a carpenter; his son was a baker; he married Miss Tailor. Carpenter, Sr. was a tailor; his son was a butcher; son married Miss Baker; Baker, Sr. was a butcher; his son was a tailor; son married Miss Carpenter. Tailor, Sr. was a baker; his son was a carpenter and he married Miss Butcher. Too easy?

Winners: George Langans, The Lummus Co., NYC; N. Tracy Walker, Illinois Pure Aluminum Co.; Isabel Farkas, Ternstedt Division, GMC, Detroit; Mrs. Calvin Pendley, L. Silver & Sons, Wichita, Kansas; Mrs. Jean Varlese, Pressure Vessel Research Committee, NYC; W. J. Fairbanks, Fairbanks Wire Co., Addison, Ill.; and Frank Bailey and Harold White, Goodyear Aircraft Corp., Akron, Ohio.

New Reader

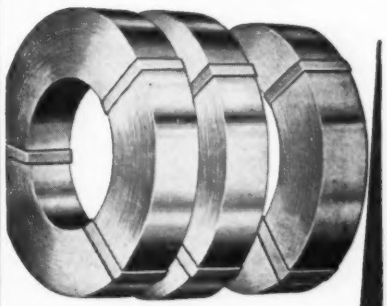
We know there's many a nip and tuck battle for first look at THE IRON AGE in the many plants, offices and homes it reaches. But we think Walter Bloom, vice president of Betmur Steel Corp., Detroit, has really got a problem.

Here's a snapshot of Walter's

boxer Penelope taken at Detroit's Recess Club. A close look at the photo shows Penelope reading a copy of your favorite family journal. Mr. Bloom suggests Penelope is preparing for the position of eighth or ninth vice president with the help of THE IRON AGE.

But after an even closer look at Penelope we suggest he give the noble beast first crack at the book each week.

Alloy Strip in Precision Sizes meets New Design Needs...



From 0.0005 in. to 0.040 in. thick and 0.090 to 6 in. wide, these alloys are available as special-tolerance strip:

Beryllium Copper
Phosphor Bronze
Nickel Silver
Brass
Chromium Copper
Stainless 17-7PH
Invar
Magnetic: High Nickel

Some immediately available. Others rolled to order in 2 to 21 days. Can be supplied in coils or straight lengths with slit or filed edges—also cadmium plated.

Write for Bulletin 7 TODAY.

PENN
PRECISION PRODUCTS, INC.
501 Crescent Avenue • Reading, Pa.

SALES OFFICES

New York — *H. G. WILLIAMS, Ramsey, N. J.*
Philadelphia — *J. A. RHODES, Upper Darby, Pa.*
Boston — *F. G. STROKE*
St. Louis — *J. A. CROWE*
Cleveland — *L. D. ALSPACH*
Houston — *RANDOLPH SALES CO.*
Chicago — *R. A. BURKETT*
Los Angeles — *KRUSEN WIRE & STEEL CO.*

WAREHOUSES

New York — *BERYLLIUM COPPER SUPPLY CO., Little Falls, New Jersey*
Chicago — *PRECISION STEEL WAREHOUSE INC.*
Los Angeles — *KRUSEN WIRE & STEEL CO.*

are you getting "tomatoes" or "potatoes" WHEN YOU BUY METAL STAMPINGS?

After selling tomatoes for less than they cost, a huckster may recoup his losses by making a long profit on potatoes.

By operating on a "catch-as-catch-can" basis such as this, a metal stamping concern might come out ahead . . . *if extremely fortunate.* But, how about its customers . . . those who are buying either sub-standard "tomatoes" or high priced "potatoes"?

No customer expects to pay more than is fair . . . no customer expects to get less than his share . . . and at Crosby no customer does, for a uniform price policy is maintained with care.

Each quotation is calculated on the same basis: Costs are carefully computed on a single standard of quality plus a fair and reasonable profit. In this way, Crosby is assured of the working capital required to pay employees adequately and to keep the plant in tip-top operating shape . . . both of direct benefit to customers.

By netting a reasonable return on each job produced, Crosby is in a position to produce all jobs efficiently and economically. In short, when you do business with Crosby, there are no "tomatoes" or "potatoes."

THE CROSBY COMPANY

METAL STAMPING SINCE 1896 · THE CROSBY COMPANY · BUFFALO, N.Y.

195 Pratt Street, Buffalo 4, N. Y.

OFFICES: Chicago • Cleveland • Detroit • New York • Philadelphia

EXHIBITS, MEETINGS

Western Metal Show—March 25-29, Los Angeles. (American Society for Metals, 7301 Euclid Avenue, Cleveland 3).

Welding Show—Apr. 8-12, Philadelphia. (American Welding Society, 33 W. 39th St., N. Y.).

Engineered Castings Show — May 6-10, Cincinnati. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.).

Design Engineering Show — May 20-23, New York. (Clapp & Poliak, 341 Madison Ave., N. Y. 17).

Packaging & Handling Show—Oct. 28-31, Atlantic City. (SIPMHE, One Gateway Center, Pittsburgh 22).

Metal Show — Nov. 2-8, Chicago. (American Society for Metals, 7301 Euclid Ave., Cleveland 3).

MARCH

American Society of Tool Engineers — Silver anniversary annual meeting, March 23-28, Shamrock Hilton Hotel, Houston, Texas. Society headquarters, 1007 Puritan Ave., Detroit.

Instrument Society of America—Pittsburgh section, annual conference on instrumentation for the iron and steel industry, March 26-27, Hotel Roosevelt, Pittsburgh. Society headquarters, 845 Ridge Ave., Pittsburgh.

ASME-AIEE — Fifth annual engineering management conference, March 27-28, Penn-Sheraton Hotel,

Continued on P. 16

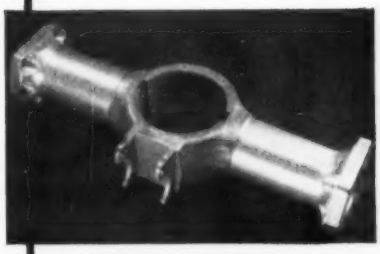
How DOUGLAS

saved 25,000 manhours!

With SPEED-D-BURR PRECISION BARREL FINISHING*

An Incredible $140,000.00 in Dollar Savings!

Time consuming handwork, production delays, difficulty in controlling uniformity and high costs in deburring a wide variety of parts in short runs was a problem faced by Douglas Aircraft. Turning to precision barrel finishing as a possible solution, a survey of various types of equipment and sample lot testing of many parts followed. SPEED-D-BURR engineers recommended a 4 unit installation to begin production *(picture above)*. Within a few weeks, savings began to mount, parts were being turned out faster than ever before and close tolerance finish quality was greatly improved on widely diversified parts from a 30" long casting to small washers—all in the same SPEED-D-BURR installation. Time study records indicated that projected manhour savings would reach 25,000 for the year with a dollar savings of $140,000.00 *(more than 10 times the equipment cost)*.



ONE SAVINGS EXAMPLE

Part No. 5638557-3

Hand Deburr . . .	$11.25 each
Speed-D-Burr . . .	.50 each
SAVINGS	$10.75 each

This is just one of many parts on which exceptional savings were made using SPEED-D-BURR Precision Barrel Finishing.

Service Is Our Most Important Product . . . It Does Not Cost . . . IT PAYS!

Like to read the whole story? Ask for Speed-D-Burr Folder DA-1 . . .

ALSO WRITE FOR CATALOGS:

- *How to Cut Production Costs 80% or More*
- *The Futurama Series*
- *The Mity-Mite Series*
- *Media and Compounds*
- *Hot Sawdust Barrels*
- *Handling and Separating Equip.*

*As told in Iron Age Magazine — August 2, 1956

SPEED-D-BURR CORPORATION — PRECISION BARREL FINISHING — DESIGNERS • ENGINEERS • MANUFACTURERS

THE WORLD'S MOST COMPLETE LINE OF PRECISION BARREL FINISHING EQUIPMENT & SUPPLIES

SPEED-D-BURR CORPORATION

3613 SAN FERNANDO RD., GLENDALE 4, CALIF.

Distributorships available in some key areas . . . to complete our national sales network.

New Snyder Special Transfer Replaces Automation in Processing Forged Steel

Special Features of Snyder Machine No. 55-44

1. Production: 146 pieces per hour.
2. 26 Stations: 28 Operations per piece: 2 milling, 1 sawing, 4 hollow milling, 3 reaming, 1 countersinking, 10 drilling, 5 spotfacing, 1 threading and 1 tapping.
3. Palletized fixtures each carrying two parts.
4. Parts quickly and accurately clamped and located and unclamped by combination torque wrenches and hydraulically operated mechanisms at Stations 1 and 26.
5. Ten individual base segments provide maximum flexibility for future part design changes.
6. Ample room between segments for tool changes and maintenance.
7. Motorized fixture return conveyor with fixture washing unit.
8. Ample chip and coolant facilities.

Standard Features of Snyder Machines

1. SNYDER SELF-CONTAINED UNITS and other units equipped with hardened and ground ways.
2. Threading and tap heads equipped with individual leadscrew spindles.
3. Minimum downtime for tool changes because spindles are arranged for pre-set cutting tools.
4. Standard and special parts interchangeable for speed and economy in maintenance.
5. Motorized automatic lubrication system for all moving parts.
6. Construction to J.I.C. Standards throughout.
7. Master Push Button Panel and Light Console at Station 1.
8. Each unit equipped with its own push button control station for ease of tool setup and manual operation of unit.
9. Electrical interlocks and full depth circuit throughout.
10. Panels equipped with SNYDER CIRCUIT SLEUTH.

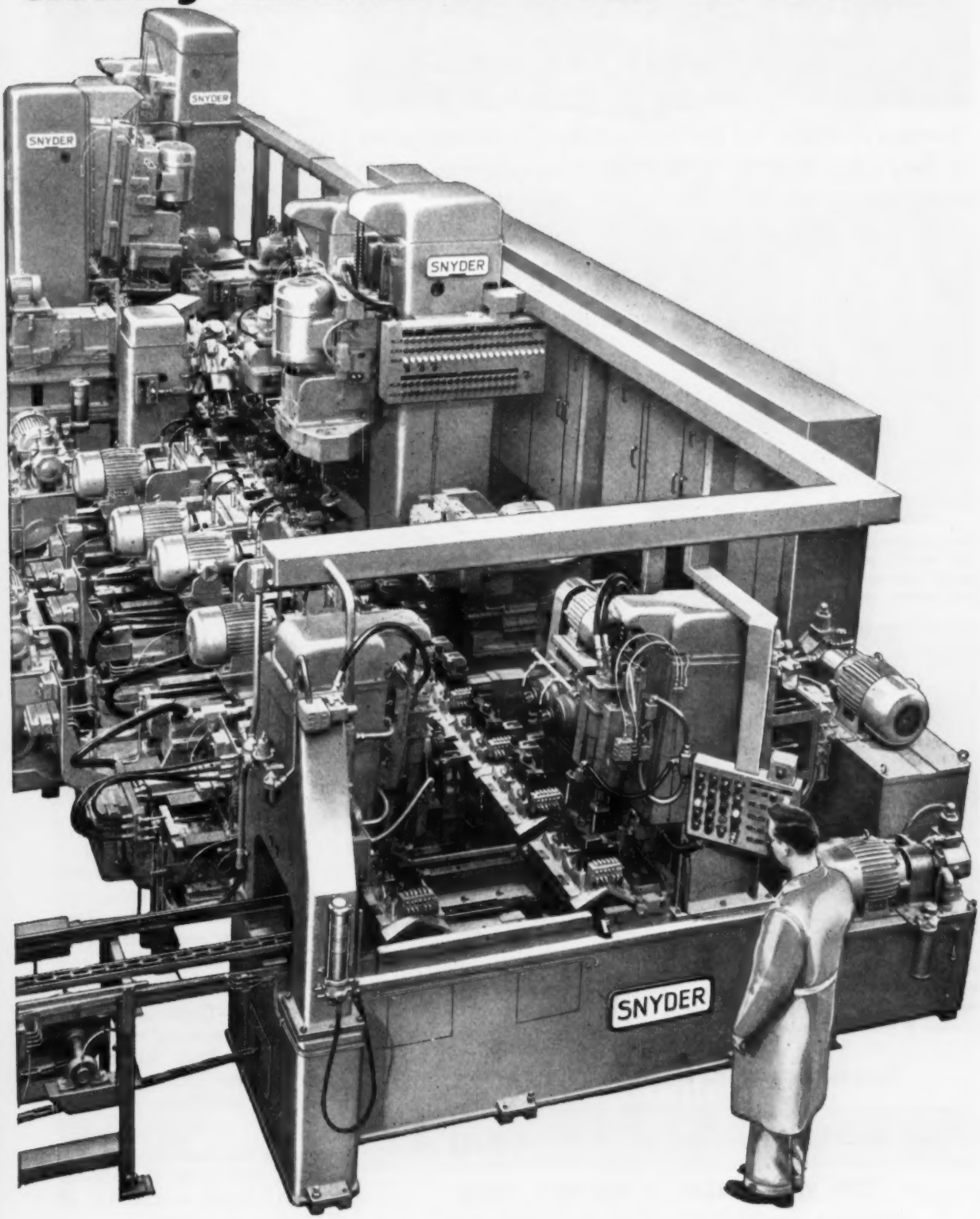
SNYDER

TOOL & ENGINEERING COMPANY

3400 E. LAFAYETTE • DETROIT 7, MICHIGAN

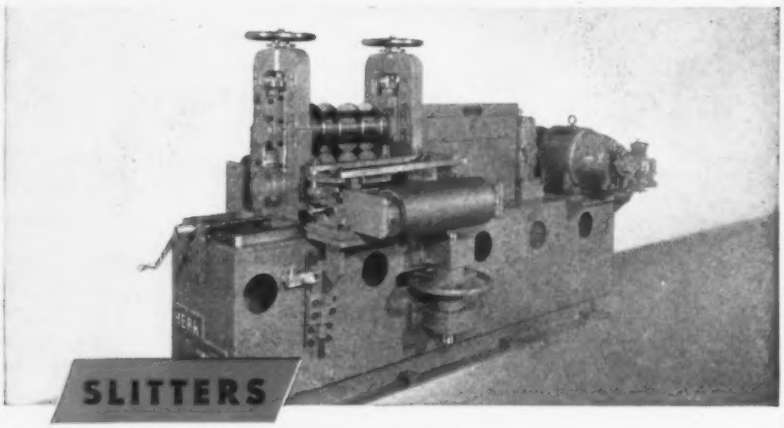
32 Years of Special Machine Tools with Automation

Several Semi-Standard Machines with Steering Knuckles for British Car Builder



HERR EQUIPMENT

"Complete Processing and Handling Equipment . . . for any Ferrous or Non-Ferrous Material . . . That Starts — or Ends — as a Coil"



SLITTERS

Built to insure dependable, high precision slitting. All thicknesses from .001 to ⅛", any commercial width. Quick, extremely accurate knife set-up. Also complete high precision slitting lines including pay-off reel, leveler, slitter, scrap winder, scrap chopper and coiling reel.

COILING REELS

Wide variety of types and sizes for coiling ferrous and non-ferrous strip. Fixed, adjustable or automatically aligning bases. Automatic oscillating level winding drive if desired. Link type contracting mandrels; manually or hydraulically operated. Furnished complete ready for use.

Write for fully descriptive Bulletin No. 561 today!

THE HERR EQUIPMENT CORPORATION

1260 VINE STREET • WARREN, OHIO

CLEVELAND, INDIANAPOLIS AND BERKELEY, CALIFORNIA

EXHIBITS, MEETINGS

Continued from P. 13

Pittsburgh. Society headquarters, 29 W. 39th St., New York.

APRIL

American Hot Dip Galvanizers Assn.—Annual meeting, Apr. 2-3, The Empress Hotel, Miami Beach, Fla. Society headquarters, 1806 First National Bank Bldg., Pittsburgh.

National Screw Machine Products Assn. — Annual spring meeting, Apr. 7-11, Shoreham Hotel, Washington, D. C. Society headquarters, 2860 E. 130th St., Cleveland.

Malleable Founders' Society—Market development conference, Apr. 10-11, Edgewater Beach Hotel, Chicago. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

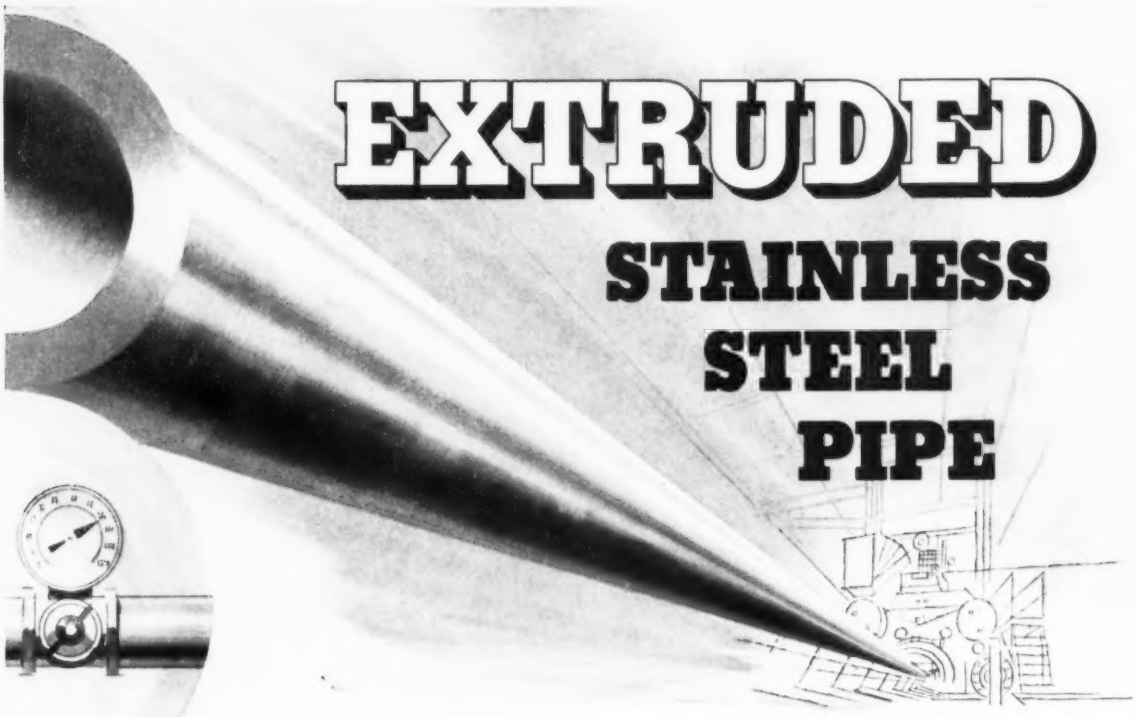
American Society of Mechanical Engineers — Spring meeting, Apr. 8-10. Dinkler - Tutwiler, Birmingham, Ala. Society headquarters, 29 W. 39th St., New York.

Metal Treating Institute — Annual spring meeting, Apr. 8-10, Boca Raton, Fla. Society headquarters, 271 North Ave., New Rochelle, N. Y.

American Society of Lubrication Engineers — Annual meeting, Apr. 15 - 17, Sheraton - Cadillac Hotel, Detroit. Society headquarters, 84 E. Randolph St., Chicago.

SAM-ASME—Twelfth annual management engineering conference, Apr. 25-26, Hotel Statler, New York. Society headquarters, 74 Fifth Ave., New York.

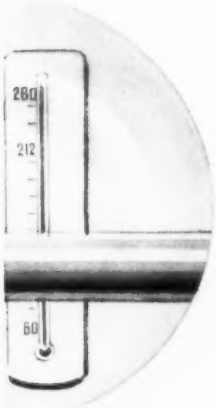
American Zinc Institute — Annual meeting, Apr. 25-26, Drake Hotel, Chicago. Society headquarters, 60 E. 42nd St., New York.



EXTRUDED STAINLESS STEEL PIPE

...for maximum service in high pressure, heat and corrosion applications

- Type 310 and 316 alloys • 10 to 20 inch diameters
- Lengths to 50 feet • Schedule 40 and heavier wall thicknesses



High Integrity Pipe, for the toughest applications of the power, petroleum, chemical, and other industries, is now being *extruded* at the Metals Processing Division of Curtiss-Wright. In the Division's giant 12,000-ton horizontal steel extrusion press, the inherent properties of stainless steel alloys are transformed into pipe to your specification under tremendous one-push pressures. The result is uniformly high strength . . . high resistance to pressure, heat and corrosion. Investigate the superiority of this new pipe for your application.

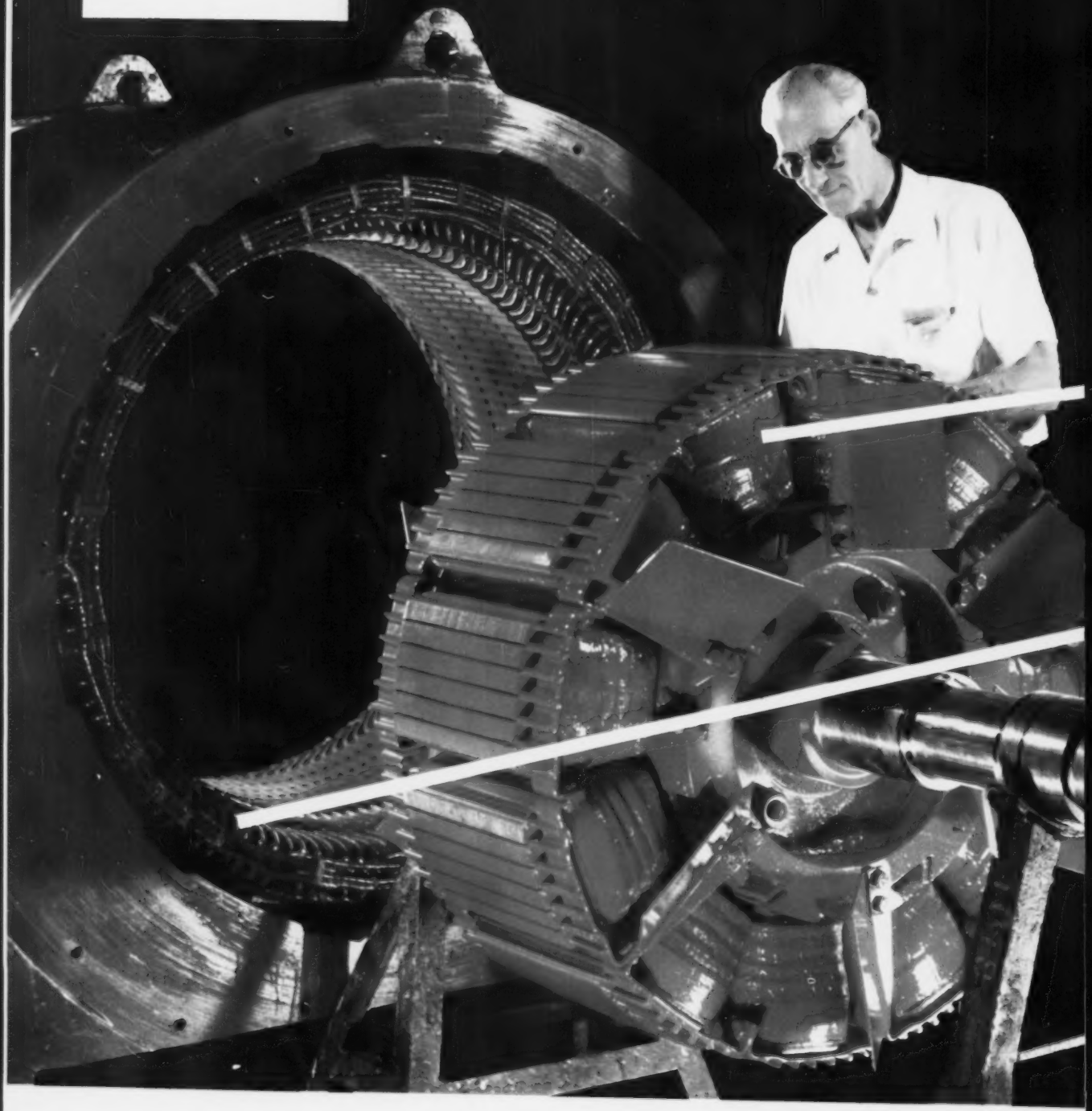
Tooling is in stock for prompt action on standard requirements as listed above. Inquiries are invited regarding special orders for diameters smaller than 10 inches and for alloys other than the standard 310 and 316.

72 Grider Street

METALS PROCESSING DIVISION
CURTISS-WRIGHT
CORPORATION • BUFFALO, N. Y.

Branch Offices:
50 Rockefeller Plaza, New York, New York • 131 N. Ludlow Street, Dayton 2, Ohio • 2700 Lincoln Blvd., Santa Monica, Calif. • 4101 San Jacinto, Houston 4, Texas • City Bank Bldg., Chicago, Illinois
In Canada: CURTISS-WRIGHT of Canada, Montreal, Que.

ONLY Allis-Chalmers



ALLIS-

MOTORS are "double protected"

New Integrated Field Coils Plus *Silco-Flex* Stator Insulation Provide Superior Motor Protection... Under Any Operating Conditions

1

Integrated Field Coils are bonded in heat-stabilized resins, enclosed in a resin-impregnated sheath of oriented glass fibers and bond-locked on the pole structure . . . dimensionally stable to withstand heating and thermal shock, vibration and fatigue at elevated temperatures . . . sealed throughout against atmospheric contaminants and fully protected against destructive forces.

2

***Silco-Flex* Insulation** provides a homogeneous, void-free insulating wall of silicone rubber on stator coils. It is unexcelled in life and thermal stability at high temperatures . . . resistant to most chemicals, water, weather . . . outstanding in flexibility and resilience . . . able to withstand abrasion and corona . . . resistant to physical and mechanical forces.

Exclusive Allis-Chalmers "double protection" is available on large electrical machines with operating temperatures through Class B range.

Silco-Flex is an Allis-Chalmers trademark.

For more information on these quality insulation systems contact your nearby A-C office, or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin for Integrated Field Coil Bulletin 05R8525 and *Silco-Flex* Insulation Bulletin 05R8341.

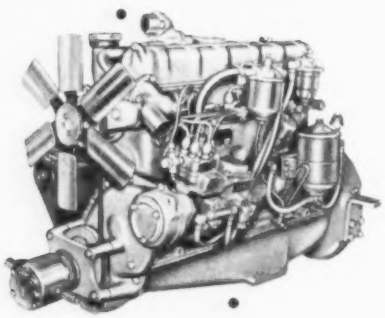
Allis-Chalmers "Double Protection," with integrated field coils and Silco-Flex stator coil insulation, adapts this 600-hp, 2300-volt, 600-rpm synchronous motor to the most severe operating conditions.

CHALMERS

A-C ALLIS-CHALMERS

A 5221

LOOK UNDER THE HOOD.....see the reason ALLIS-CHALMERS fork trucks outperform from the start



No matter how you look at it, fork truck performance starts with the engine. That's why you can expect an Allis-Chalmers fork truck to outperform *right from the start.*

Allis-Chalmers engines are real heavy-duty, industrial-type — the strongest and most rugged used in a fork truck. Every part is built to exceed maximum wear and stress expectancy, putting thousands of extra work hours into Allis-Chalmers fork trucks—keeping them on the job.

But durability is only part of the story. Compare an Allis-Chalmers fork truck in material moved per hour and you will quickly see what an engine with extra usable torque and responsive acceleration can contribute. Here is power to outproduce!

Like the entire truck, Allis-Chalmers engines are built for quick servicing, too, and are so simple to repair they can be completely overhauled *without removal from the truck.*

Since Allis-Chalmers builds its own engines, (gasoline, diesel and gas), they are interchangeable in the trucks — and you will find an amazing 85 percent parts interchangeability.

Send for literature, or ask your Allis-Chalmers material handling dealer to tell you more about this power to outperform — plus the other outstanding features of Allis-Chalmers fork trucks.

MATERIAL HANDLING DEPARTMENT, BUDA DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

BH-38

Imagine a mile-wide ball with surface finish accurate to within 1/16"

If Hoover could make this giant bearing ball—one mile in diameter—and maintain Hoover quality of precision manufacture, the immense sphere would be so smooth that surface finish would be accurate to within 1/16 inch!

In actual terms, the surface smoothness of a Hoover Ball is measured on a micro-inch basis. Roundness and diameter are held within 25 millionths of an inch. Microscopic precision, both in smoothness and spherical accuracy, means quality in Hoover *Micro-Velvet* Lapped Balls.

Equipment which will measure surface quality to a fraction of one millionth of an inch is used to check and re-check Hoover Balls. A perfectly matched set of *Micro-Velvet* Balls goes in each bearing.

These precision-made balls team up with the ultra-smoothness and minutely exact curvature perfection of famous *Hoover Honed* Raceways.

The result . . . equalized load, high capacity, and quiet operation, assuring superior operating performance and long life.

Investigate Hoover's complete line of balls, made in many metals, as well as light, medium and heavy series ball bearings. Engineering assistance is readily available to manufacturers. Write for information.

hoover

BALL AND BEARING COMPANY, ANN ARBOR, MICHIGAN

Hoover Honed and *Micro-Velvet* are Hoover Trademarks.

HOOVER HINTS:

Factors Involved In Bearing Selection

Application is the key to bearing selection. The importance of a bearing's characteristics is relative to the job it must do. Usually one of the most important factors is the capacity or load-carrying ability. Also important in many applications is the type of loading—thrust, radial or combined . . . the amount of friction involved . . . the ease of assembling a bearing into a unit . . . the danger of misalignment . . . the limiting maximum speed.

All types of anti-friction bearings are concisely compared and analyzed from an engineer's standpoint in "Engineer's Handi-Book of Anti-Friction Bearings." Send for yours now.

Hoover Ball and Bearing Company,
Ann Arbor, Michigan.

Mail my copy of "Engineer's Handi-Book of Anti-Friction Bearings."

Name _____

Title _____

Company _____

Address _____

City _____ State _____

9

want on-the-spot service?

Then you'll like Crucible's *special steel* warehouse service. It's designed to insure dependable, nearby delivery of practically *any* special steel you need, when you need it. And in just about *any* quantity.

Next time you need special steels – call Crucible. You'll find we're *big enough to serve you – small enough to want to.*

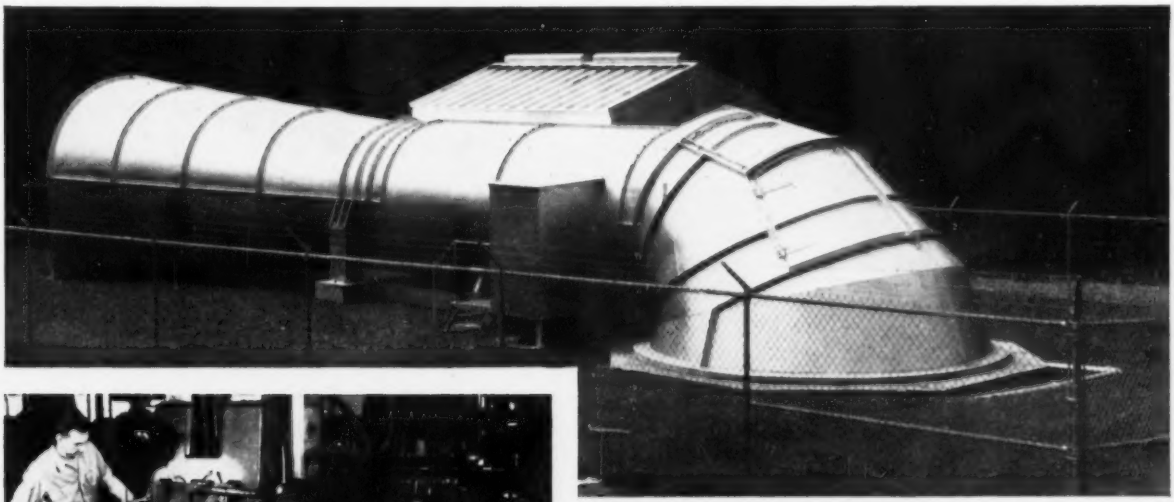
Stocks maintained of:
Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting Die and Plastic Mold Steel, Drill Rod, Tool Bits, and Hollow Tool Steel Bars) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . Max-el, HY-Tuf, AISI Alloy . . . Onyx Spring, Hollow Drill Steel and other special purpose steels.

CRUCIBLE WAREHOUSE SERVICE

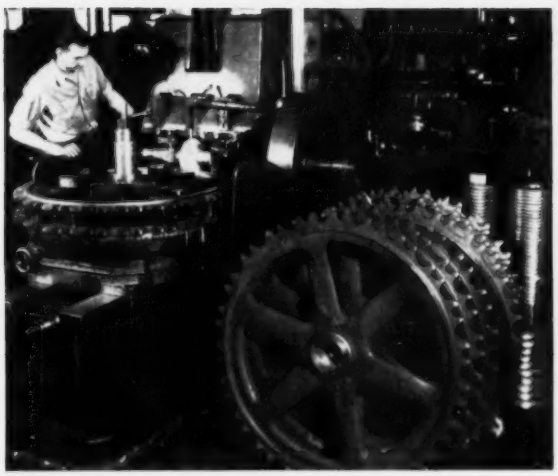
Crucible Steel Company of America

General Sales Offices, The Oliver Building, Mellon Square, Pittsburgh 22, Pa. Branch Offices and Warehouses: Atlanta • Baltimore • Boston • Buffalo • Charlotte Chicago • Cincinnati • Cleveland • Dallas • Dayton • Denver • Detroit • Harrison • Houston • Indianapolis • Los Angeles • Milwaukee • New Haven • New York Philadelphia • Pittsburgh • Portland, Ore. • Providence • Rockford • San Francisco • Seattle • Springfield, Mass. • St. Louis • St. Paul • Syracuse • Toronto, Ont.

Mechanization by JEFFREY is world-wide

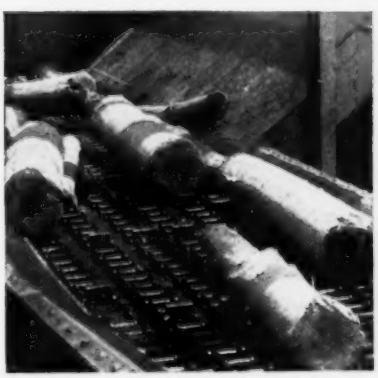


Jeffrey AERODYNE® Fans provide the push to keep air coursing properly through mines and industrial plants.



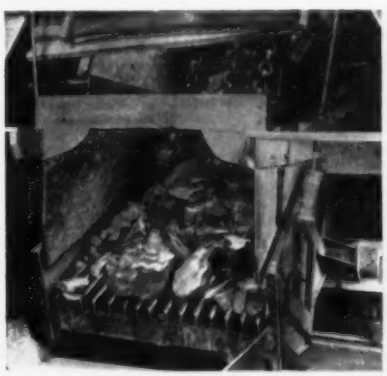
Precision machining of Jeffrey sprockets matches the fine workmanship employed in manufacturing Jeffrey chain.

Jeffrey engineers solved the problem of storing and reclaiming huge quantities of rock with this portable stacker.



Broad bottomed PW® chain was designed by Jeffrey for use where chain drags on gritty runways. It lasts longer.

This 4½ mile Jeffrey conveyor moves up to a thousand tons of coal per hour from cleaning plant to power plant.

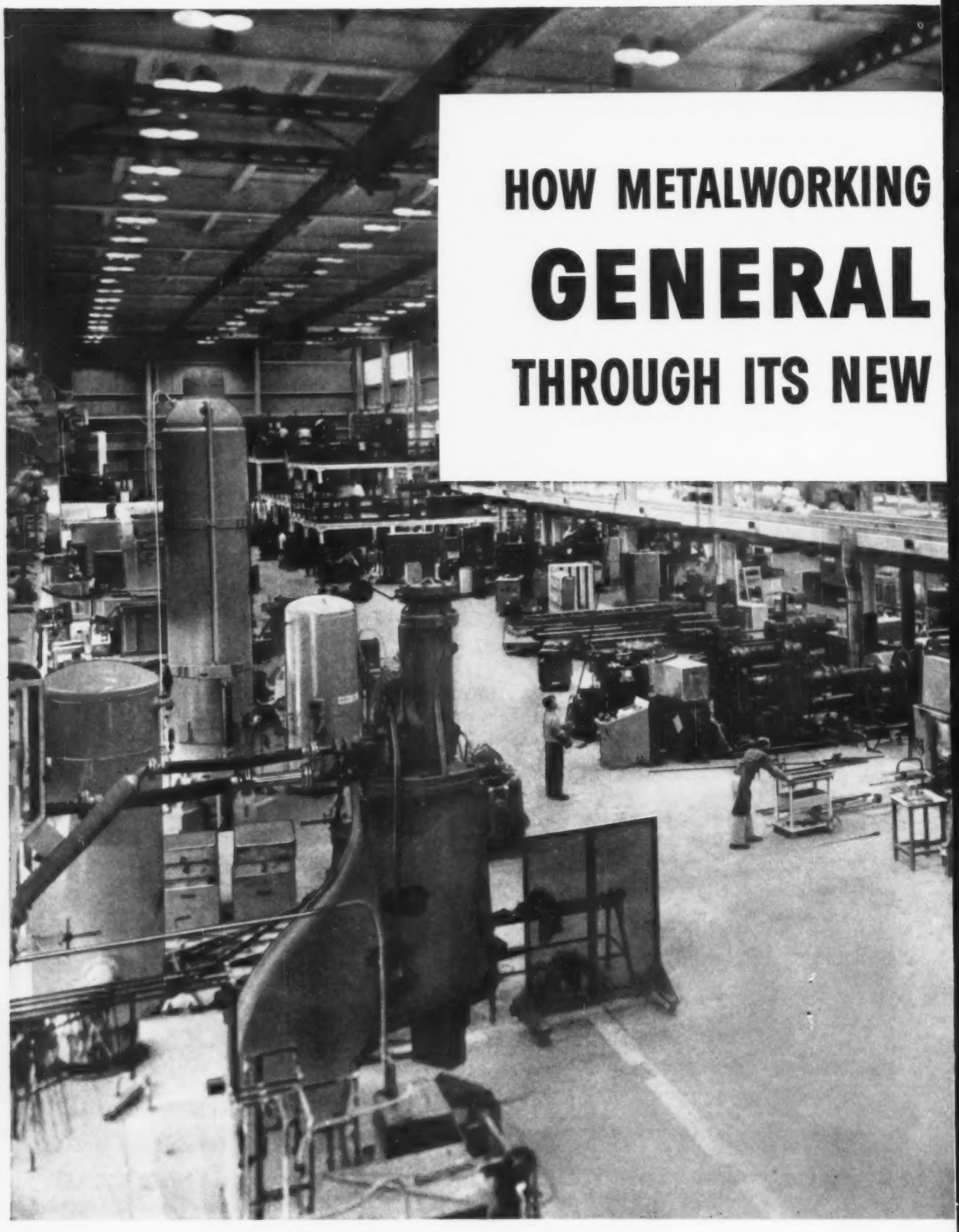


Three men, formerly required to push wet materials across screens, were eliminated by this Jeffrey vibrating grizzly feeder.

Jeffrey produces coal and metal mining machinery, conveying and processing equipment, chains, power transmission machinery and related products. Jeffrey engineers complete systems and integrates individual units. Jeffrey has a world-wide reputation for quality products, sound engineering and fine service.

JEFFREY

THE JEFFREY MANUFACTURING COMPANY
COLUMBUS 16, OHIO



HOW METALWORKING GENERAL THROUGH ITS NEW

Laboratory with factory-size equipment—that's the new $5,000,000 G-E metals and ceramics laboratory in Schenectady. From here will come many of the products manufactured by the Metallurgical Products Department of General Electric Company, 11153 E. 8 Mile Road, Detroit 32, Michigan.

BENEFITS FROM THE RESOURCES OF

ELECTRIC

METALLURGICAL PRODUCTS DEPARTMENT

Solutions to your most pressing problems, plus developments ahead of industry trends, are now being worked out in our laboratories

It doesn't take a crystal ball to know what role cutting tools will play in the Metalworking Industry in the future. The signs are unmistakable.

More accurate casting, extruding, and forging techniques will mean that less metal must be removed by machining. And this will mean that cutting tools must take thinner cuts, and hold closer tolerances.

New and more automatic machine tools will mean that cutting tools must operate at higher speeds – yet provide the longer tool life necessary to give you maximum benefits from automation.

General Electric, through its new Metallurgical Products Department (successor to the Carboloy Department), has already developed several cutting tool materials that are ahead of these trends.

Three years ago, the first of the three Carboloy® Series 300 carbides was announced. Today, these grades permit you to cut harder steels, at higher speeds . . . at lower machining cost per part.

Two years ago, General Electric researchers introduced Cemented Oxide. This material puts mirror finishes on metal, while operating at speeds up to 3000 fpm – far beyond the range of carbides and ceramics.

And last year, G-E Engineers in the Carboloy Machinability Laboratory developed several new machining techniques to help you make better use of these improved materials. One of these techniques lead to a way to utilize carbides at low speeds – starting from 0 fpm – an almost impossible task until now.

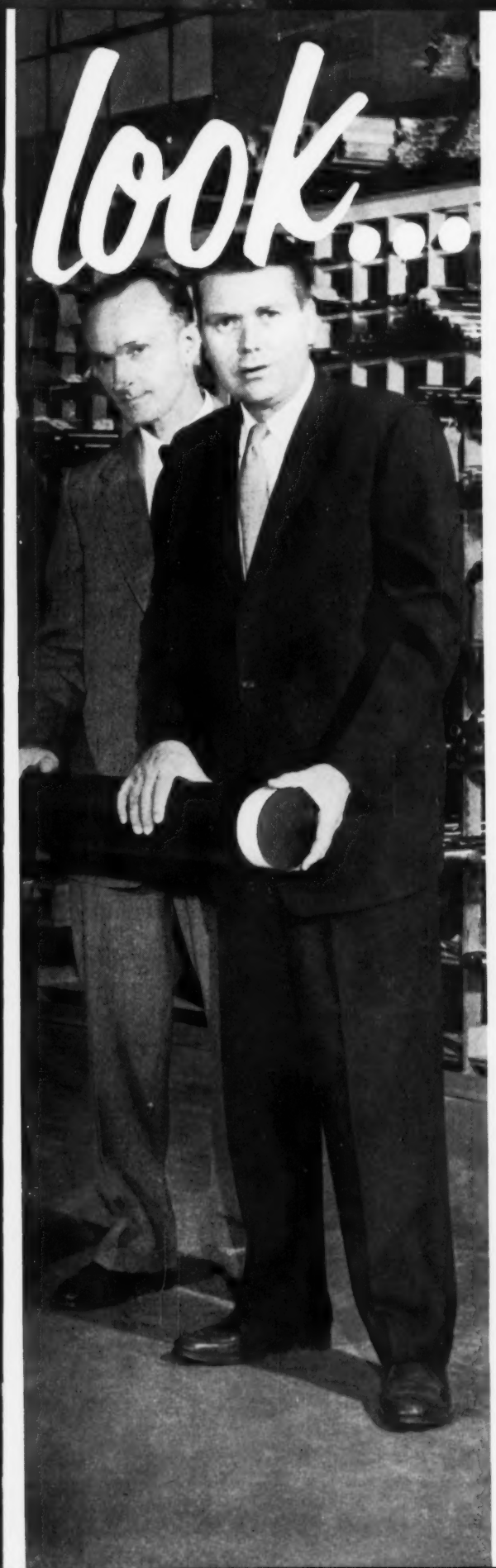
All these developments resulted from the vast technological resources which General Electric has brought to bear on metalworking problems – plus the fund of machining knowledge accumulated since G-E first introduced carbides to American industry in 1928.

These resources and this knowledge mean that General Electric–through its Metallurgical Products Department–will be able to recognize and solve new problems of the Metalworking Industry as they arise.

Progress Is Our Most Important Product

GENERAL ELECTRIC

Take a new



at how *Carpenter* can help you free dollars for more productive uses

As you know, every dollar tied up in inventory shortens productive cash by an equal amount. And inactive stocks of specialty steels are an unnecessary luxury.

That's why we ask—have you called Carpenter lately?

If not, you may be missing a good bet to shift inventory cash into more profitable channels. Here's why.

Your Carpenter Mill-Branch Warehouse is now in the best position ever to meet your day-to-day needs for tool, stainless and alloy steels . . . quickly and without hesitation.

What's more, this comprehensive Mill-Branch Warehouse program is backed by direct service from the Reading Mill to quickly meet unusual requests for special grades and sizes.

Add together the order desk people . . . your Carpenter Representative . . . the warehouse crew, and the office staff, and you have *team action* that spells increased dependability. Whether you want information on prices . . . technical literature to simplify heat treating . . . or actual in-shop assistance — there's a specialist at Carpenter ready to help you.

Start today! Let your nearby Carpenter Mill-Branch Warehouse be your own stock room . . . help you free your inventory dollars for more productive uses. A phone call is all that's needed to get you underway. The Carpenter Steel Co., 121 W. Bern St., Reading, Pa.

Carpenter STEEL

Mill-Branch Warehouse Service

Mill-Branch Warehouses, Offices and Distributors in Principal U. S. Cities

Sets a New High in Automatic, High-Volume Production

A typical example of one Jones & Lamson approach to "automation" is this line. Here is completely automatic handling with both machine transfers and inter-machine transfers. In this line are 4 Fay automatic lathes and 1 milling and center-drilling machine. J & L machines of this type have been in use for many years in production plants throughout the world.

The simple, rugged transfers used in this line were designed, engineered and built by J & L. Control combinations are, of course, tailor-made for each individual application.

Automatic handling is also adapted to grinding operations, as shown by this J & L Model "E" Grinder (inset photo) which handles 136 steering worms per hour.

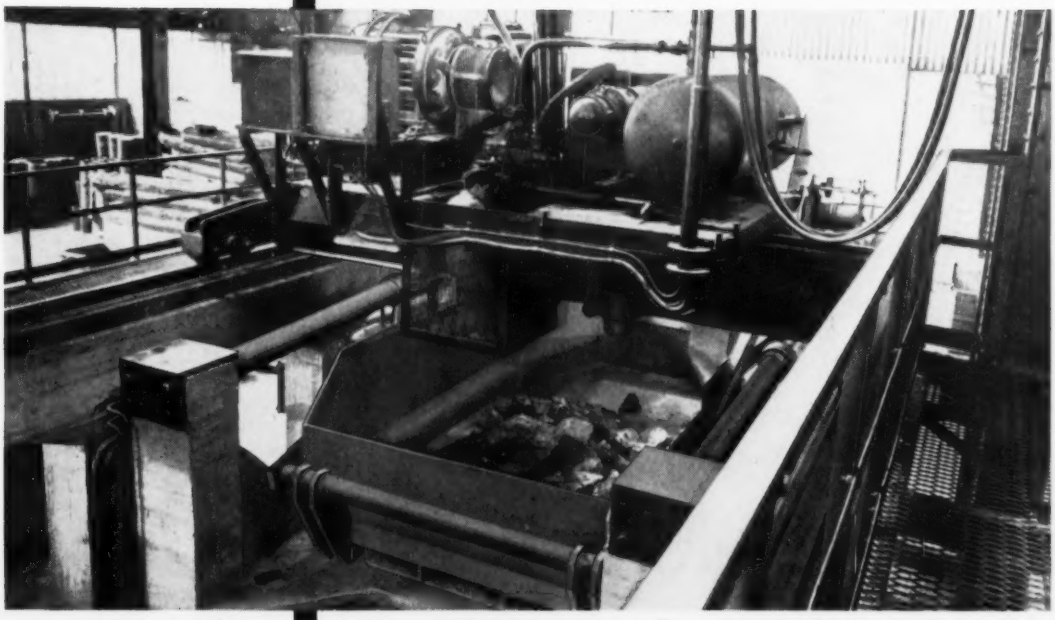
Send for Catalog No. 56. JONES & LAMSON MACHINE COMPANY, 511 Clinton Street, Springfield, Vermont.

JONES & LAMSON "AUTOMATION"

the man who needs a new machine tool is already paying for it

Turret Lathes • Fay Automatic Lathes • Milling & Centering Machines • Optical Comparators • Thread Tools Thread & Form Grinders

new CHROME SLAB BREAKER



Patented

Saves time, Cuts cost, Eliminates bottlenecks

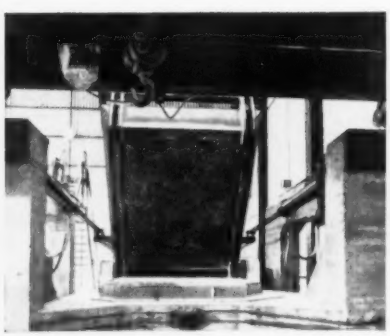
This revolutionary machine was designed for the purpose of breaking up chrome slab for the metallurgical industry. It is capable of breaking up a chrome slab 8 to 12" thick, and dumping it into a car, in a matter of minutes, replacing the slow, outmoded "drop weight" method.

The photograph of the machine shows the transverse bridge mounted on two tracks, which rest on elevated foundations, with a table mounted on the transverse bridge, carrying the hoist, hammer and compressor, with the operator sitting to one side. The hammer can be propelled longitudinally or transversely, enabling the operator to strike the slab at any point he desires. All controls of the machine are at the operators finger tips.

Underneath the transverse bridge is shown the anvil dump which carries the anvil, weighing approximately fifteen tons. The slab to be broken is placed on this and is broken up to required sizes, as shown. After the breaking is completed, the bridge and hammer and the entire upper machine is moved back clear of the anvil, and then the hydraulic rams, located on the side, lift the anvil dump to a 45° angle, discharging the broken material. The dump then is lowered back into place and the machine moves out with its hoist, as shown on the right of the hammer cylinder, and picks up a new slab, placing it on the anvil ready to be broken.

The hammer is operated with a compressor ranging from 420 to 550 cu. ft., depending on the size hammer installed, either 7" or 10" bore. The hammer will deliver a 64,000 foot pound blow 50 times a minute, off 100# pressure. The minimum output for the machine on conical shape billets is 8 tons an hour, whereas on a flat slab its capacity is *several times greater.*

These patented machines are now being used in foreign countries and throughout the United States.

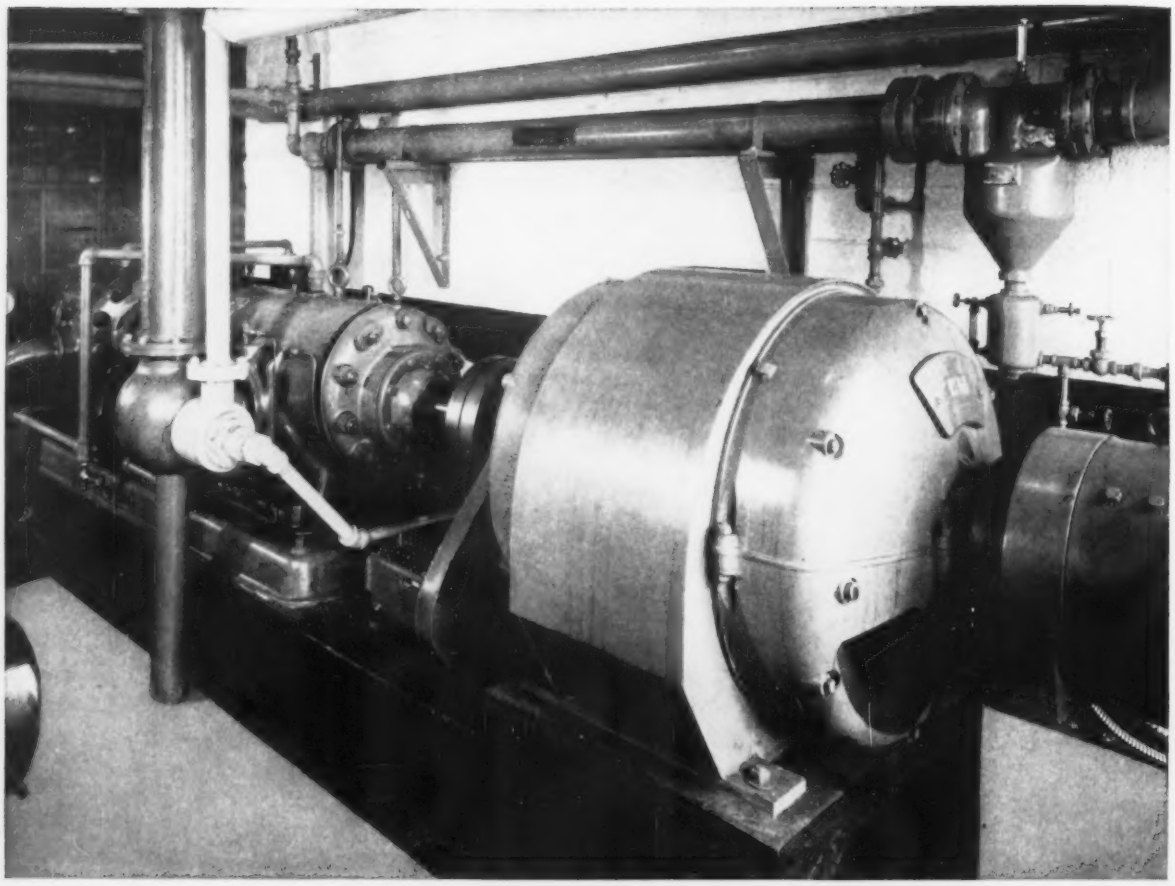


Anvil dump in raised position. Note hydraulic rams, hammer head and hoist hook.

WRITE FOR COMPLETE INFORMATION

R.P.B. CORPORATION

DEPT. IA, 2751 EAST 11TH STREET, LOS ANGELES 23, CALIFORNIA



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The proof is the record. Reading Tube Corporation bought its first Fuller Two-Stage Rotary Compressor in 1944—a C50-50H. To meet expanding pneumatic power requirements for increased production, they added a C100-100H Rotary in 1946. Again, the only and obvious choice was Fuller. In 1953, Reading Tube installed its third Fuller Rotary—a C175-175H, and reports continued satisfactory and economical operation, with a bare minimum of maintenance on all three.

Reading Tube Corp. uses Fuller compressors exclusively for such variety of needs as supplying air power in their casting shop, mill, draw benches, in testing and packing, as well as for hand accessories such as grinding, polishing, drilling, etc.

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- . . . compactness and ease of installation, requires minimum space and light foundation
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(OPERATING IN WALES)

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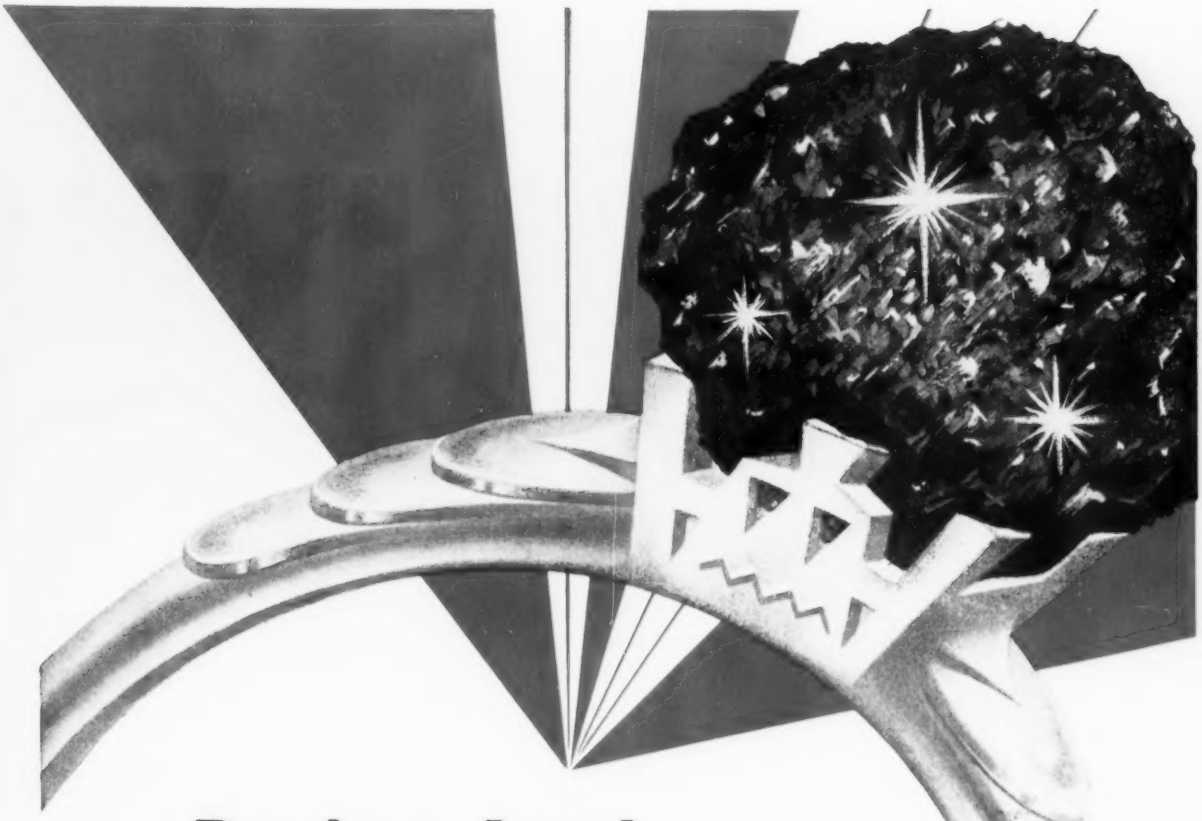

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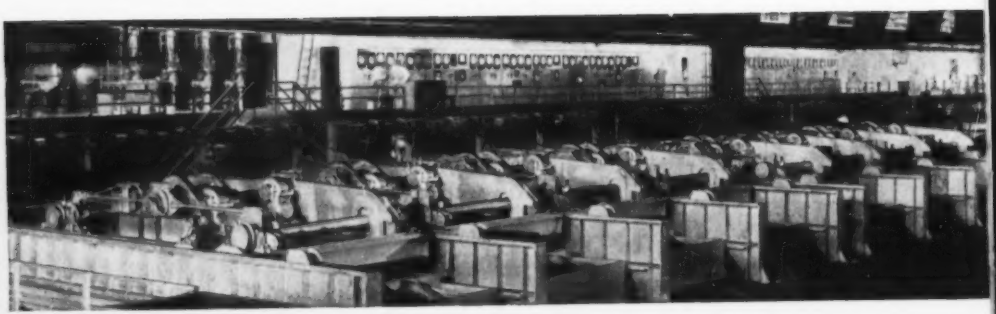

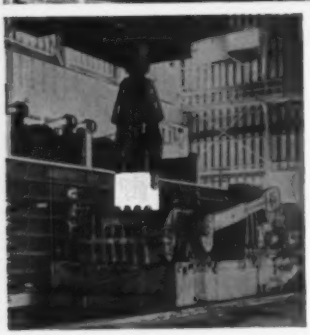

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When you see the results we believe you too will say THERMAHEADING (Warm Heading) is a basic advance in metal forming.

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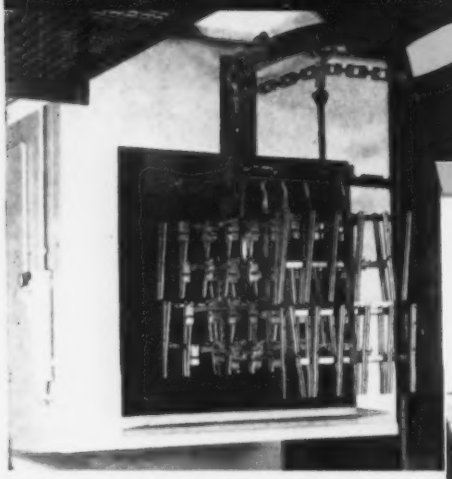
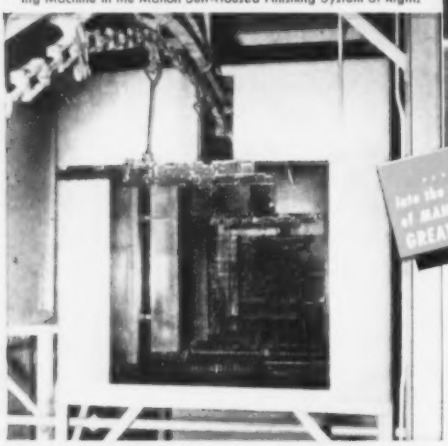
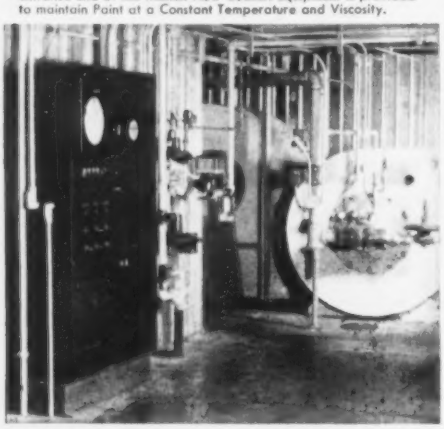


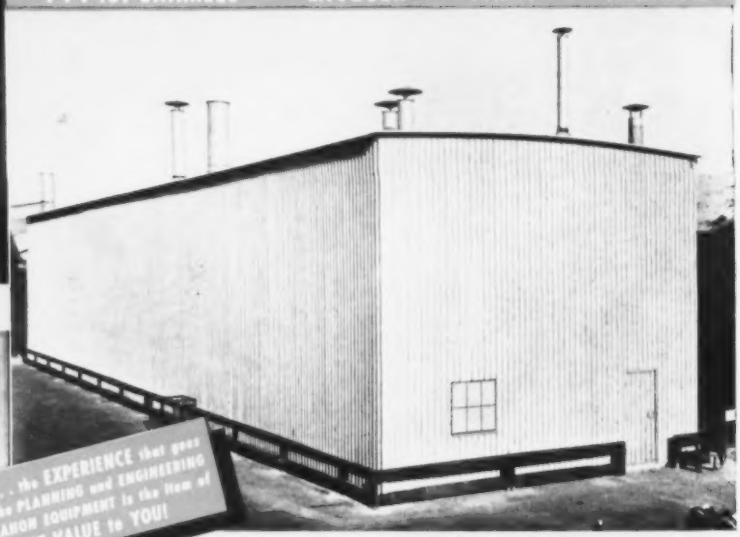
Truck Parts Entering Five-Stage Metal Cleaning and Rust Proofing Machine in the Mahon Self-Housed Finishing System at Right.



Entrance End of the Mahon Flow Coater. Equipment is provided to maintain Paint at a Constant Temperature and Viscosity.



Mahon Control Panel which Houses Temperature Recorders, Control Switches, Signal Lights and Automatic Safety Devices.



Complete Mahon Self-Housed Finishing System Installed Adjacent to Manufacturing Buildings at International Harvester Company's Plant, Fort Wayne, Indiana.

SELF-HOUSED Mahon Finishing System OUTSIDE of PLANT Solves Many SPACE PROBLEMS!

In industrial plants where adequate space is not available, or where floor space and headroom restrictions would seriously interfere with the planning and the engineering of an efficient and economical production finishing system, Mahon engineers recommend installation of a Self-Housed Finishing System on the roof of the plant, or outside the plant adjacent to manufacturing buildings . . . the installation illustrated above is an excellent example. In such installations, no restrictions are imposed by either floor space or headroom; consequently equipment can be planned and coordinated for maximum efficiency. In this particular finishing system, the equipment is installed on two levels . . . the Five-Stage Metal Cleaning and Rust Proofing Machine, the Flow Coater, the Ventilated Drip Enclosure, and the Control Panel with Recording Instruments, are located on the ground level. The Dry-Off Oven, Finish Baking Oven, Oven Heating Units, and Air Supply and Exhaust Equipment are located above on the second level. The roof and walls, which house the complete system, are an integral part of the Oven Construction. This is a highly satisfactory Mahon solution of one manufacturer's production painting problem. When you are confronted with a finishing problem, you, too, will want to discuss it with Mahon engineers . . . you'll find them better qualified to advise you on both methods and equipment requirements. See Sweet's Plant Engineering File for Information, and typical Mahon Installations, or write for Catalog A-657.

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Horizontal Right Angle Drive
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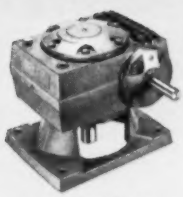

Vertical Right Angle Drive

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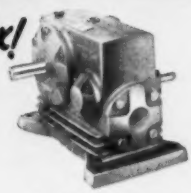
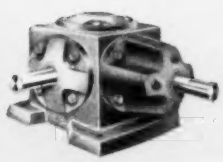
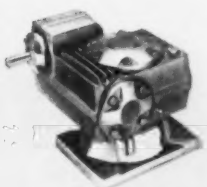


Double Reduction
Horizontal Parallel Drive



Horizontal Right Angle Drive



Double Reduction
Vertical Right Angle Drive

Horizontal Right Angle Drive

Double Reduction
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Vertical Right Angle Drive

All Ratiomotors also sold without motors as FLANGED REDUCTORS

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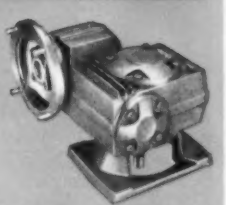

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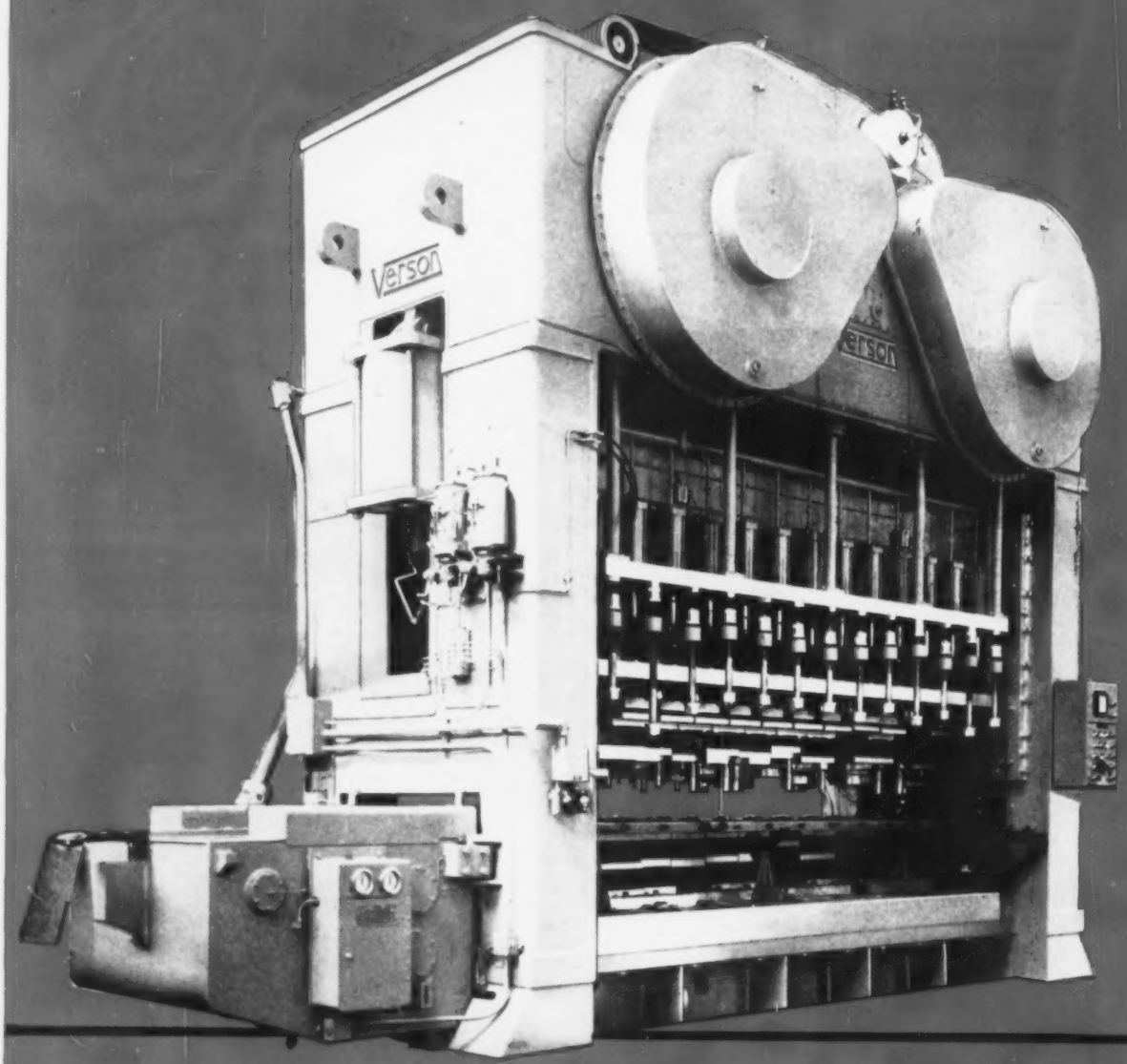

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Formed on what was described ten years ago as the "world's largest automatic deep drawing press", this drawer measures 15" x 18" x 6" deep. It is formed from .035" coil stock at the rate of 500 per hour.

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• The production figures quoted above are not theoretical rates computed on the drawing board. They are verified production figures based on day-in, day-out experience over extended periods of time.

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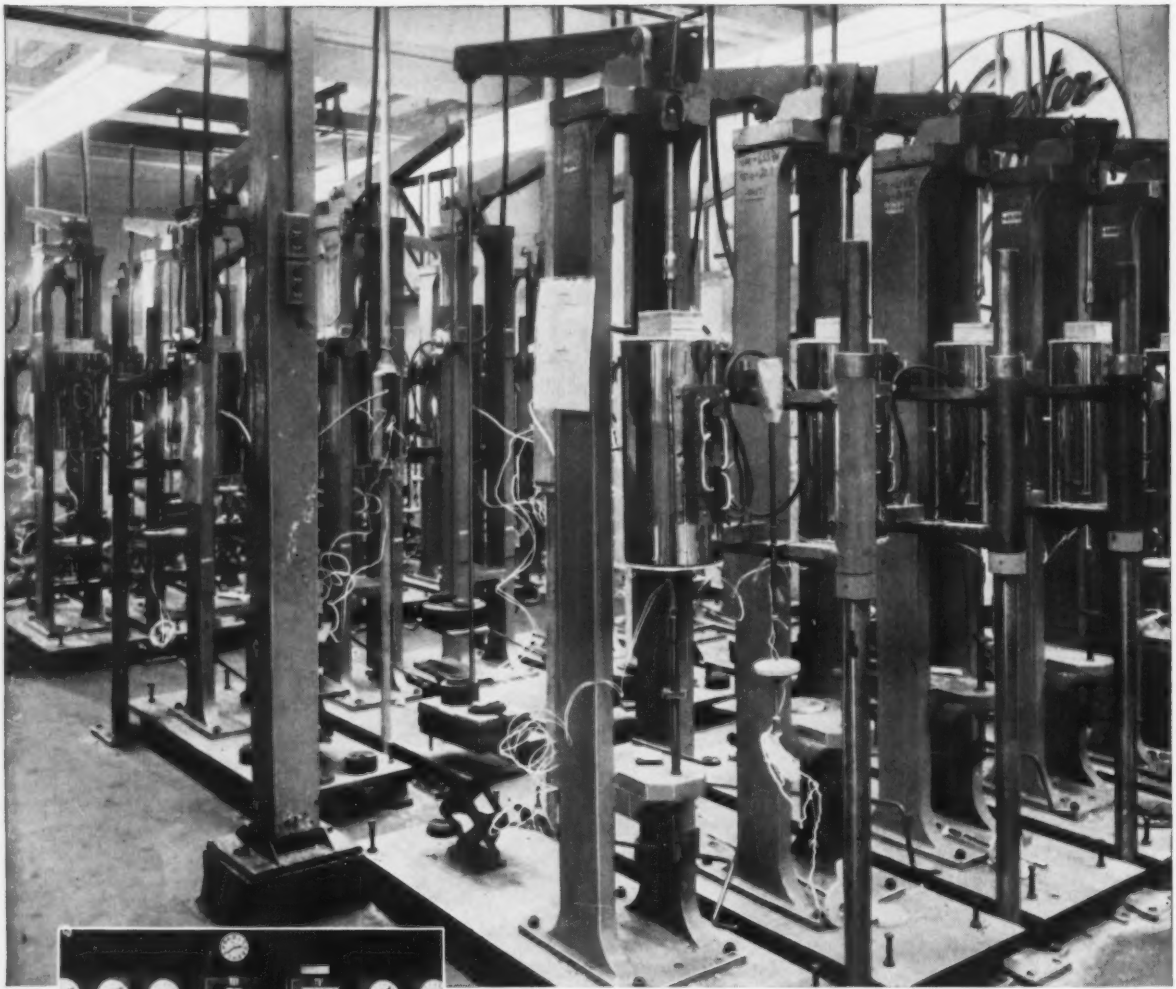

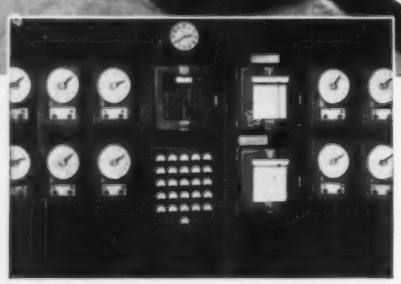

41 Speedomax® H Controllers Reduce Overshoot... Speed Recovery on Creep Rupture Machines

Here are only some of the creep rupture machines and Speedomax controllers at Wyman-Gordon, Worcester, Mass. To meet government specs for jet plane forgings made of titanium and special alloy steels, Wyman-Gordon has installed 2 banks of creep rupture testing furnaces with space-saving Speedomax H proportioning control. This combination assures them of quality control on a production basis . . . permits them to turn out part after part which will meet the stresses induced in jet propelled aircraft.

To keep production moving, Speedomax H D.A.T. control enables operators to bring furnaces up to temperature in minimum time. Rate of approach, in most cases, eliminates overshoot . . . speeds recovery time after sample change. By continuously regulating heat input in proportion to furnace needs, this Speedomax H control holds temperature of furnaces within ±2 F and in addition, eliminates the need for manually readjusting auto transformers.

Additional instrumentation includes four multiple-point Speedomax G recorders for each bank of furnaces, and 80-point and 76-point Model D Speedomax G indicators for checking furnace temperatures at any time from a central location.

Why not investigate Speedomax H when installing your next heat treating furnace—whether it's electric or fuel-fired, continuous or batch. A phone call or letter to your nearest L&N office —or to 4956 Stenton Ave., Phila. 44, Pa.—will bring you more information.

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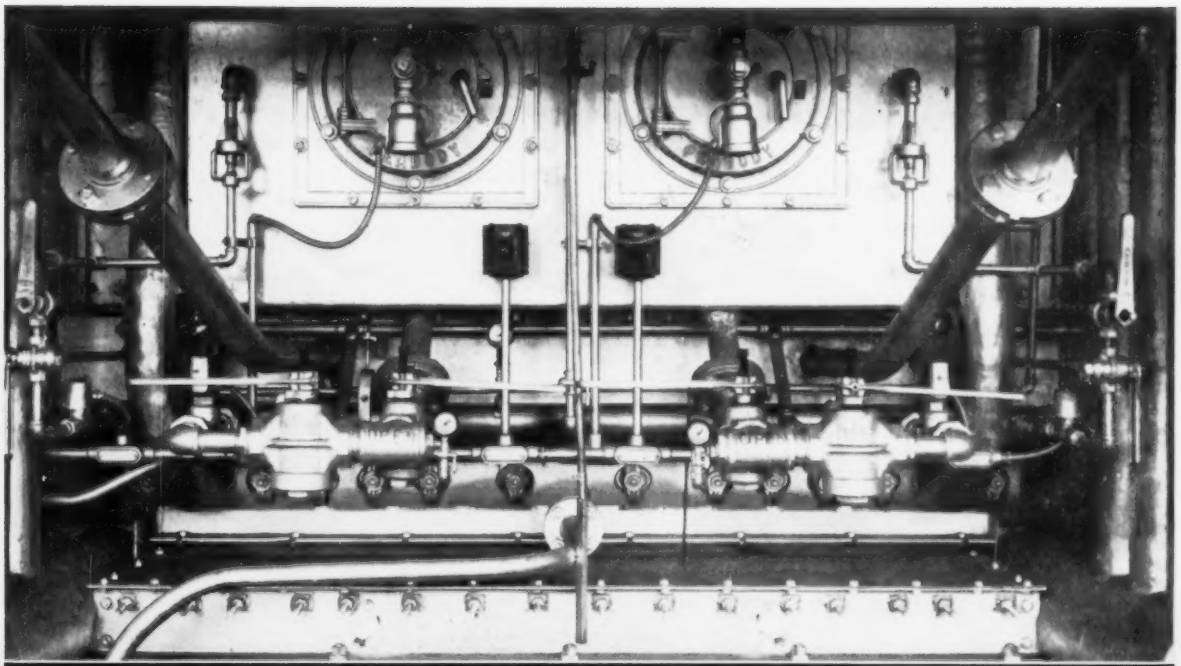

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AT A. B. DICK COMPANY, CHICAGO

An analysis of numerous types of valves convinced the A. B. Dick Company that HOMESTEAD Lubricated PLUG VALVES were well suited for use on gas lines to furnaces and boilers in their Chicago, Illinois plant. In fact, there are more than 5,000 Homestead Valves of various types in this plant. Satisfactory performance from the valves they have chosen is guaranteed by built-in features such as:

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4. Triple Head Seal—two rings of lubricant and reinforced Teflon stem seal. Stem seal holds pressure even without lubrication.

. . . plus many others. To know the meaning of real valve economy and service, install a few of these valves under your own service conditions. You'll be glad you did.

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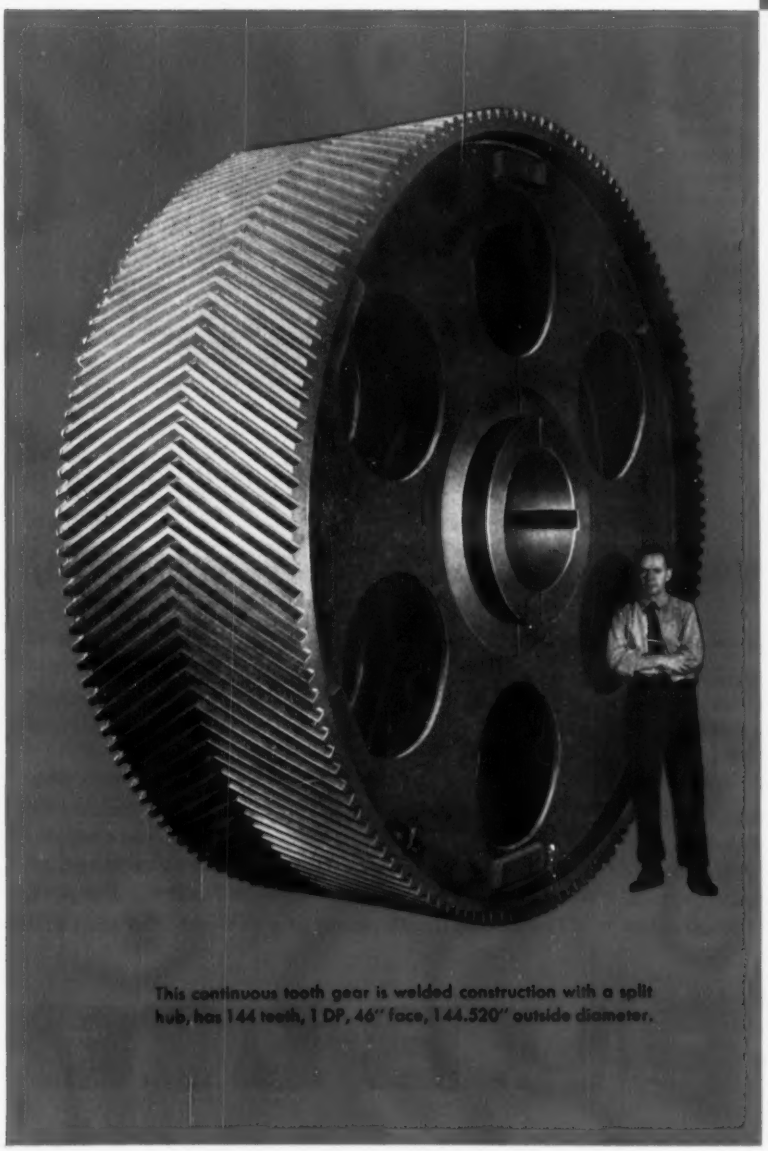
BACKBONE

comes in any size up to 23' for any power capacity



This continuous tooth gear is welded construction with a split hub, has 144 teeth, 1 DP, 46" face, 144.520" outside diameter.

Farrel continuous-tooth herringbone gears are made in a complete range of sizes from ¼ inch to 23 feet diameter, ¼ to 60 inch face, 24 DP to 0.75 DP, for any power capacity and any application.

The backbone in Farrel herringbone gears, formed by the meeting of the two helices without a center groove, puts the entire face width of the gear to work for you. This pays off in extra strength and greater load and shock capacity—ideal for heavy-duty applications.

Farrel can also supply straight tooth (spur) gears, single helical gears and internal gears in a wide range of sizes—all precision-generated on Farrel-Sykes machines.

Farrel engineers are available for consultation on your gear problems.

•

FARREL-BIRMINGHAM COMPANY, INC.
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Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.

Sales Offices: Ansonia, Buffalo, Boston, Akron, Detroit, Chicago, Minneapolis, Fayetteville (N. C.), Los Angeles, Salt Lake City, Tulsa, Houston

FB-1092

Farrel-Birmingham®

Next month!

WE'LL BE MAKING AN IMPORTANT ANNOUNCEMENT OF INTEREST TO ALL STEEL MAKERS REGARDING

Lectromelt*

FURNACES AND EQUIPMENT

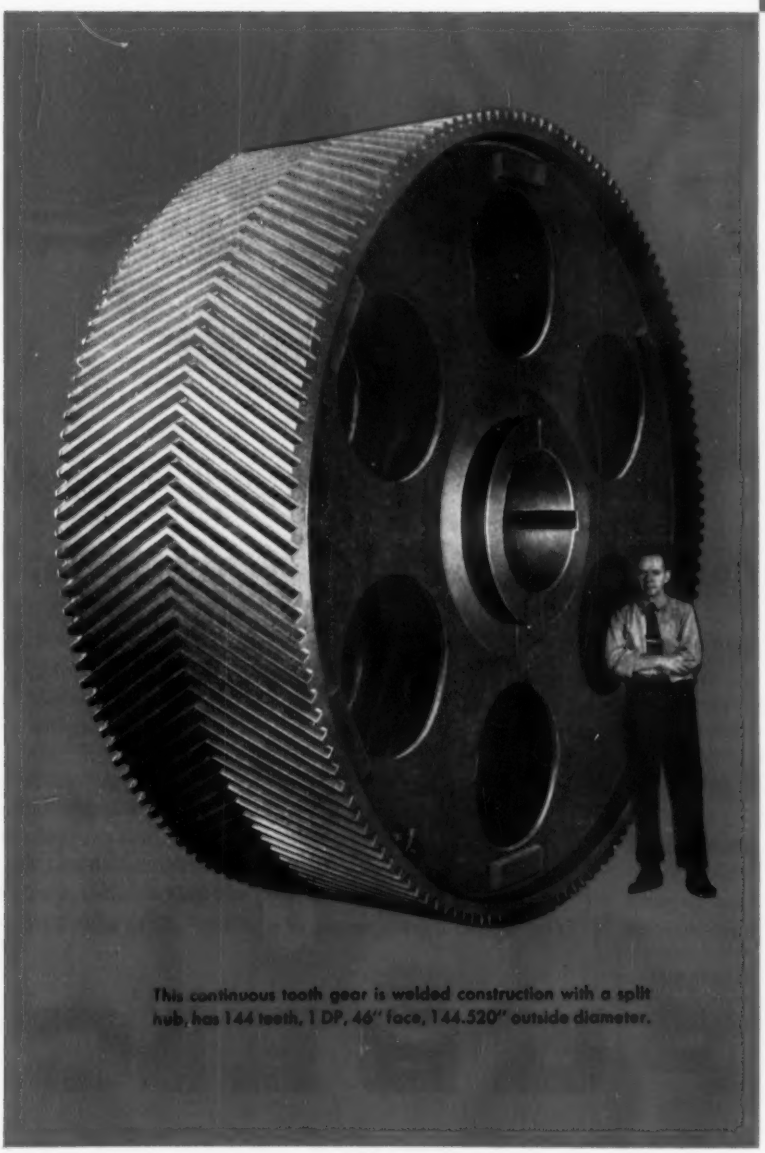
Users report they have stepped up production and reduced their costs with efficient, time-proven Lectromelt furnaces. For a copy of Catalog 9-A describing this equipment, write Lectromelt Furnace Division, McGraw-Edison Company, 312 32nd Street, Pittsburgh 30, Pennsylvania.

STANDARD SIZES UP TO TWO HUNDRED TONS CAPACITY

*Registered trademark

BACKBONE

comes in any size up to 23' for any power capacity



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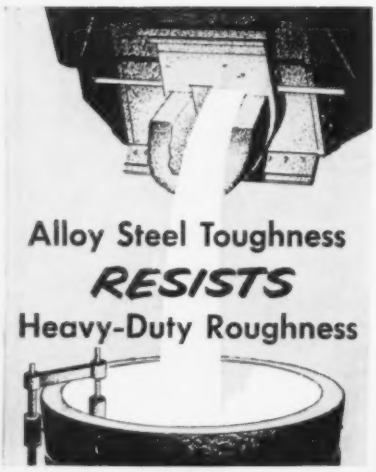


Landing-gear strut for the North American F-100C is manufactured by Bendix Products Division, Bendix Aviation Corporation. Exacting requirements for inner and outer cylinders resulted in the development of a new grade of steel by Bendix and Republic metallurgists working in cooperation with North American engineers.

How Metallurgical Teamwork Developed the Super Sabre's Tough,

When a new grade of steel is born, there's sure to be an interesting story behind it.

In this case, it's the story of close cooperation between metallurgical teams from Bendix and Republic. Their common goal: development of a tough, strong, alloy steel to withstand the shock, impact, strain and vibration of tons of aircraft hitting the runway at speeds in excess of 100 miles per hour.

It starts after World War II, when Bendix metallurgists undertook a program to correct certain characteristics and improve processing deficiencies of steels commonly used for aircraft landing gear.

Several leading steel companies, including Republic, were consulted and the program outlined. Republic immediately put its 3-Dimension Metallurgical Service Team on the problem.

The field metallurgist worked closely with Bendix metallurgists and engineers right in their own plant under actual operating conditions. Their findings were supplemented and coordinated by the other two members of the Republic team—the laboratory and mill metallurgists.

The result: development of a new grade of steel that

REPUBLIC

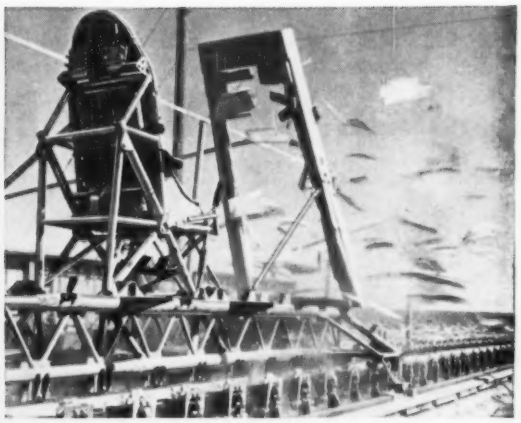
REPUBLIC STEEL

World's Widest Range of Standard Steels

Strong, Alloy Steel Landing Gear

was found ideal for application in the strength range of 220,000-240,000 psi. This steel, designated AMS 6427 by the SAE, offers maximum resistance to fatigue. Provides an exceptionally high strength-to-weight ratio. Maintains its great strength at wide temperature extremes. Responds uniformly to heat-treatment, producing hard, wear-resistant surfaces around tough cores.

Are you sure you are using the right steel? Why not make sure by using Republic's 3-D Metallurgical Service to assist you in a check-up? It's confidential. There's no obligation. Just send us the coupon.



WHERE STRENGTH IS AN IMPORTANT REQUIREMENT—such as this rocket sled for deceleration tests—manufacturers choose tubing for basic construction. At any given weight, tubing is strongest of all mechanical shapes . . . as a beam . . . in torsion . . . under compressive loads. Republic ELECTRUNITE® Steel Mechanical Tubing, the original electric resistance welded tube is well known for quality and performance. It's available in carbon and stainless steel in a wide variety of sizes, shapes and gages. Send coupon for more facts.

HIGH STRENGTH AND LIGHTWEIGHT ADVANTAGES of Republic Titanium are adding range, speed and maneuverability to both military and commercial aircraft. In the Navy's HOK-1, sections fabricated from Republic Titanium, Type RS-70 Annealed are used as the firewall between pilot and engine compartments. But, titanium should not be looked upon as strictly an aircraft or military metal. Its extremely high resistance to most forms of corrosion makes it attractive for use in processing and chemical equipment, heat exchangers, dehydration trays, anodizing racks, etc. Mail coupon for more information.

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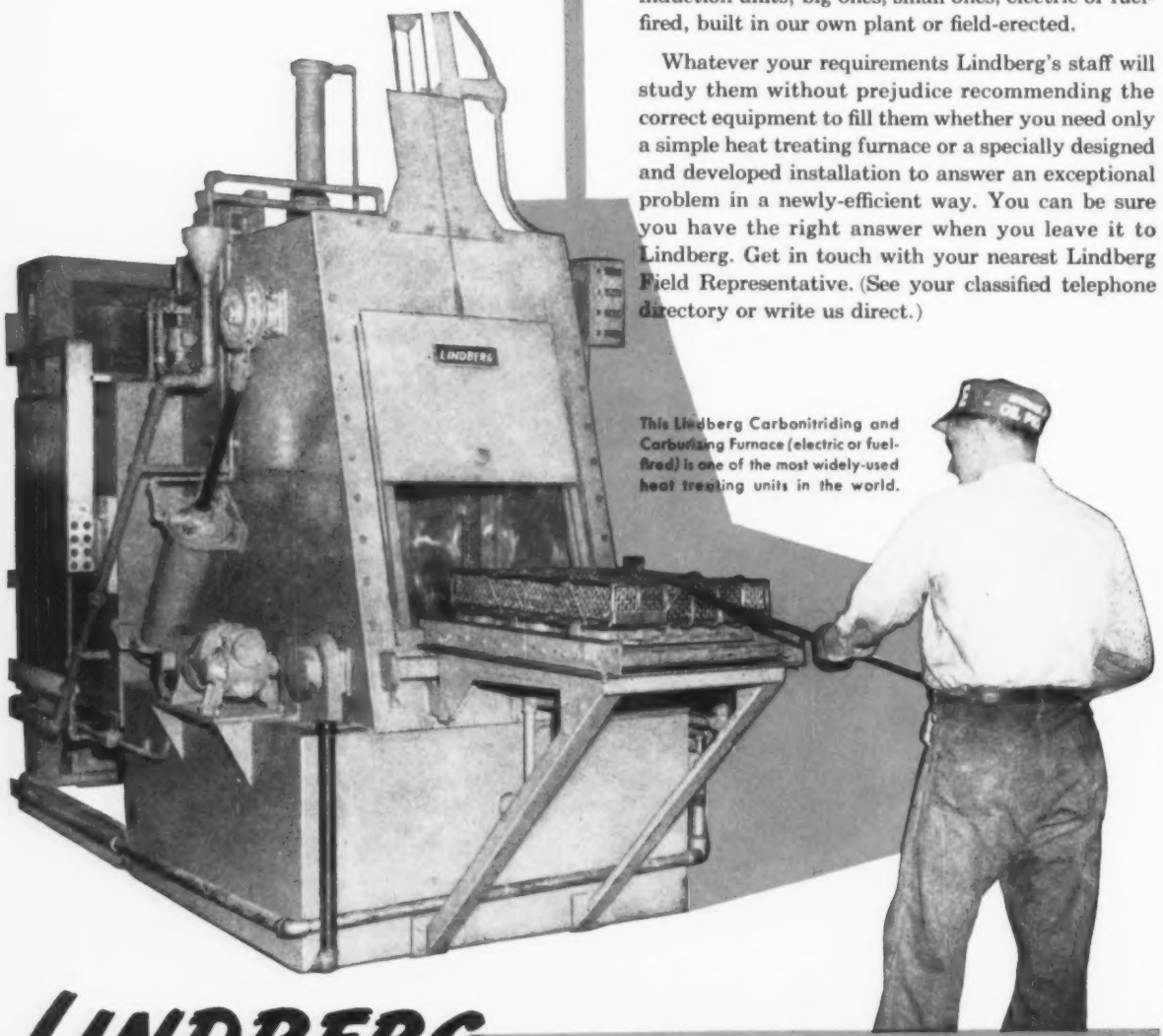
That is exactly what we can offer you at Lindberg. A design and engineering staff concerned only with the development of equipment for applying heat to industry. This staff produces the most complete line of such equipment in the industry—heat treating furnaces, melting furnaces, ceramic kilns, high frequency induction units; big ones, small ones, electric or fuel-fired, built in our own plant or field-erected.

Whatever your requirements Lindberg's staff will study them without prejudice recommending the correct equipment to fill them whether you need only a simple heat treating furnace or a specially designed and developed installation to answer an exceptional problem in a newly-efficient way. You can be sure you have the right answer when you leave it to Lindberg. Get in touch with your nearest Lindberg Field Representative. (See your classified telephone directory or write us direct.)



This Lindberg Carbonitriding and Carburizing Furnace (electric or fuel-fired) is one of the most widely-used heat treating units in the world.

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If you're at the Western Metal Show look in on Lindberg at Booth 478

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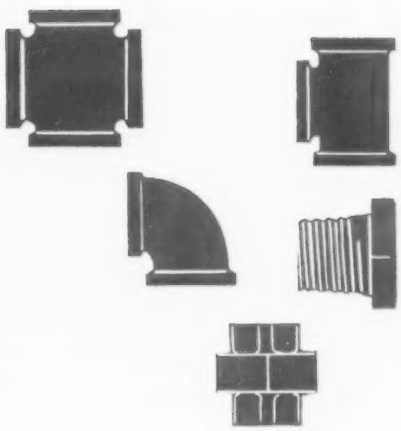

ESCO FITTINGS ARE EASY TO STOCK AND EASY TO STORE

ESCO Cast Stainless fittings come to you packed in sturdy and attractive shelf boxes for your convenience in handling. Complete description of contents is plainly indicated on each container. You'll eliminate dark space-wasting and time-wasting storage bins and be able to determine your inventory at a glance.

ESCO Cast Stainless fittings are available from convenient warehouse stocks in all standard analyses and sizes. Special cast fittings are available or can be made to engineering specifications in any size and in all analyses. Alloy designation is "in-the-metal" on all fittings.

See your nearest *ESCO* dealer — he can help you solve your corrosion problems. Ask for *ESCO* Catalog No. 175.

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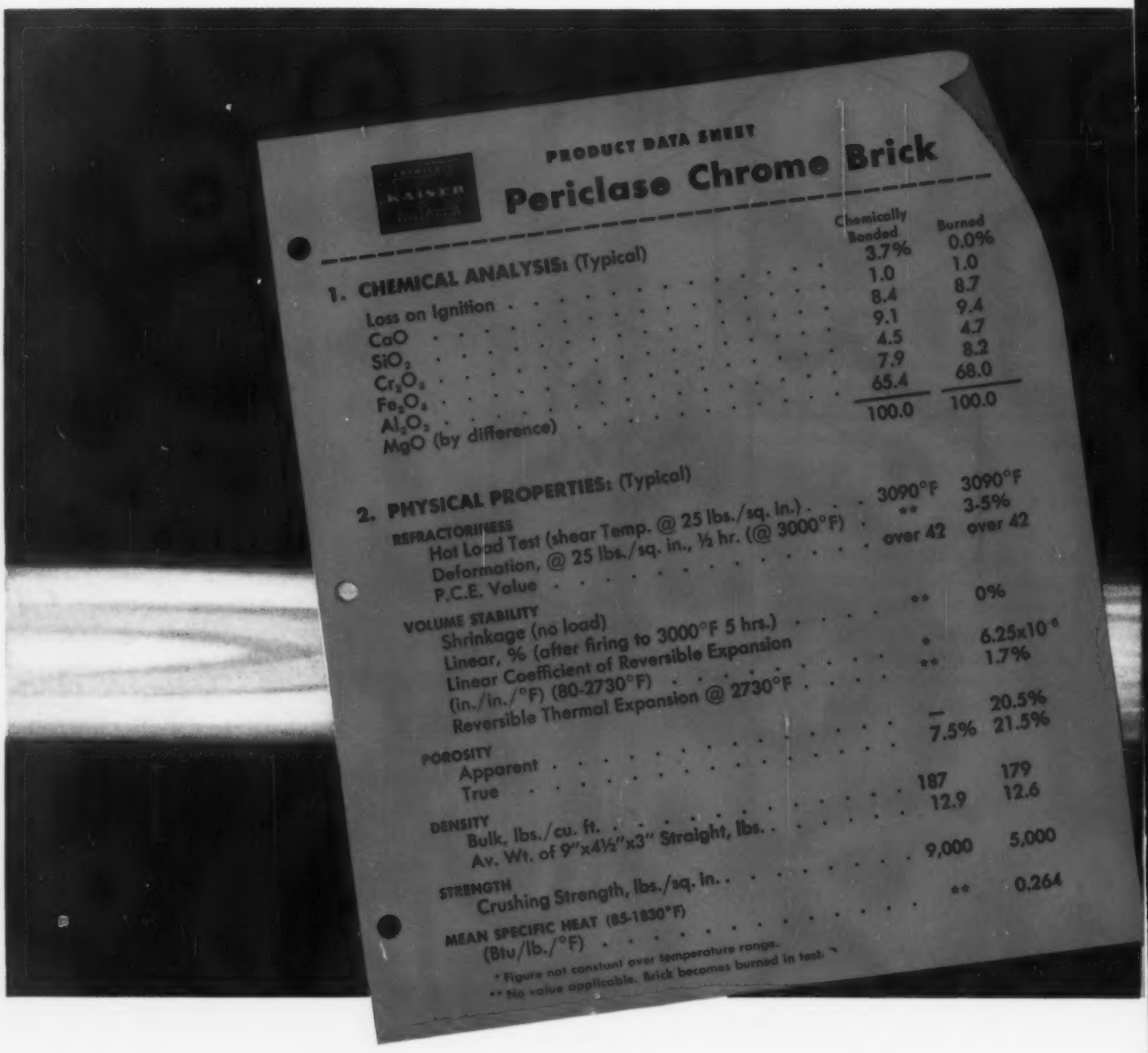

PRODUCT DATA SHEET
Periclase Chrome Brick
1. CHEMICAL ANALYSIS: (Typical)
Chemically Bonded
Burned
Loss on Ignition 3.7% 0.0%
CaO 1.0 1.0
SiO2 8.4 8.7
Cr2O3 9.1 9.4
Fe2O3 4.5 4.7
Al2O3 7.9 8.2
MgO (by difference) 65.4 68.0
100.0 100.0
2. PHYSICAL PROPERTIES: (Typical)
REFRACTORINESS
Hot Load Test (shear Temp. @ 25 lbs./sq. in.) 3090°F 3090°F
Deformation, @ 25 lbs./sq. in., ½ hr. (@ 3000°F) ** 3-5%
P.C.E. Value over 42 over 42
VOLUME STABILITY
Shrinkage (no load)
Linear, % (after firing to 3000°F 5 hrs.) ** 0%
Linear Coefficient of Reversible Expansion
(in./in./°F) (80-2730°F) * 6.25x10⁻⁶
Reversible Thermal Expansion @ 2730°F ** 1.7%
POROSITY
Apparent — 20.5%
True 7.5% 21.5%
DENSITY
Bulk, lbs./cu. ft. 187 179
Av. Wt. of 9"x4½"x3" Straight, lbs. 12.9 12.6
STRENGTH
Crushing Strength, lbs./sq. in. 9,000 5,000
MEAN SPECIFIC HEAT (85-1830°F)
(Btu/lb./°F) ** 0.264
* Figure not constant over temperature range.
** No value applicable. Brick becomes burned in test.

COMPARE THESE SPECIFICATIONS

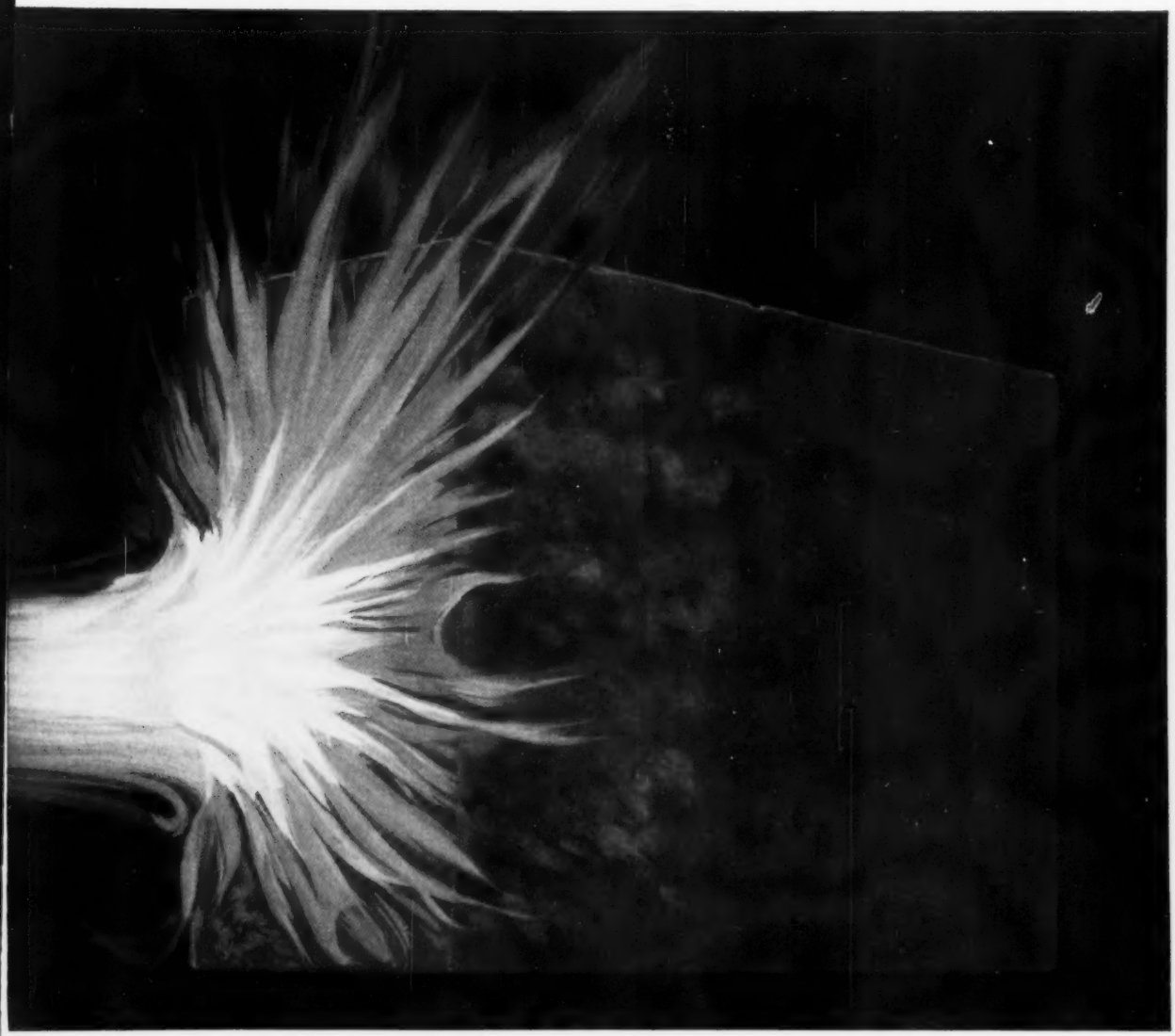
Here's proof that Kaiser Periclase Chrome Brick can give you the longest and most economical end wall service available today!

One quick comparison between the specifications above and those of *any* other end wall brick will tell you why open hearth operators all over the country specify Kaiser Periclase Chrome Brick:

1. Greatly increases end wall life when needed, or
2. Cuts costs with thinner walls, when end wall service is balanced.

This is because the PATENTED composition of Kaiser Periclase Chrome Brick assures you of less spalling, less swelling, greater resistance to abrasion and alteration by oxide and slag...

Let your Kaiser Chemicals sales engineer explain how you can take full advantage of Kaiser Periclase Chrome Brick in *your* open hearth. Contact the nearest sales office listed at right for immediate attention to your particular problem.



TO THOSE OF ANY OTHER END WALL BRICK!

More reasons why Kaiser Periclase Chrome Brick gives you better service:

1. Chromite content is the minimum amount (only 9.1% Cr_2O_3) necessary to provide thermal shock resistance. Lowering of chromite reduces swelling, thus minimizes end wall buckling.

2. A ceramic bond is formed *before* the chemical bond is destroyed.

3. No liquid phase in forming its ceramic bond. Volume stable.

4. Highest MgO content in end wall brick provides greater resistance to carryover erosion and iron oxide attack.

5. Lowest porosity minimizes alteration by resisting penetration of gases and impurities.

Call or write Kaiser Chemicals Division, Dept. S7123, Kaiser Aluminum & Chemical Sales, Inc., at any of the addresses listed below.

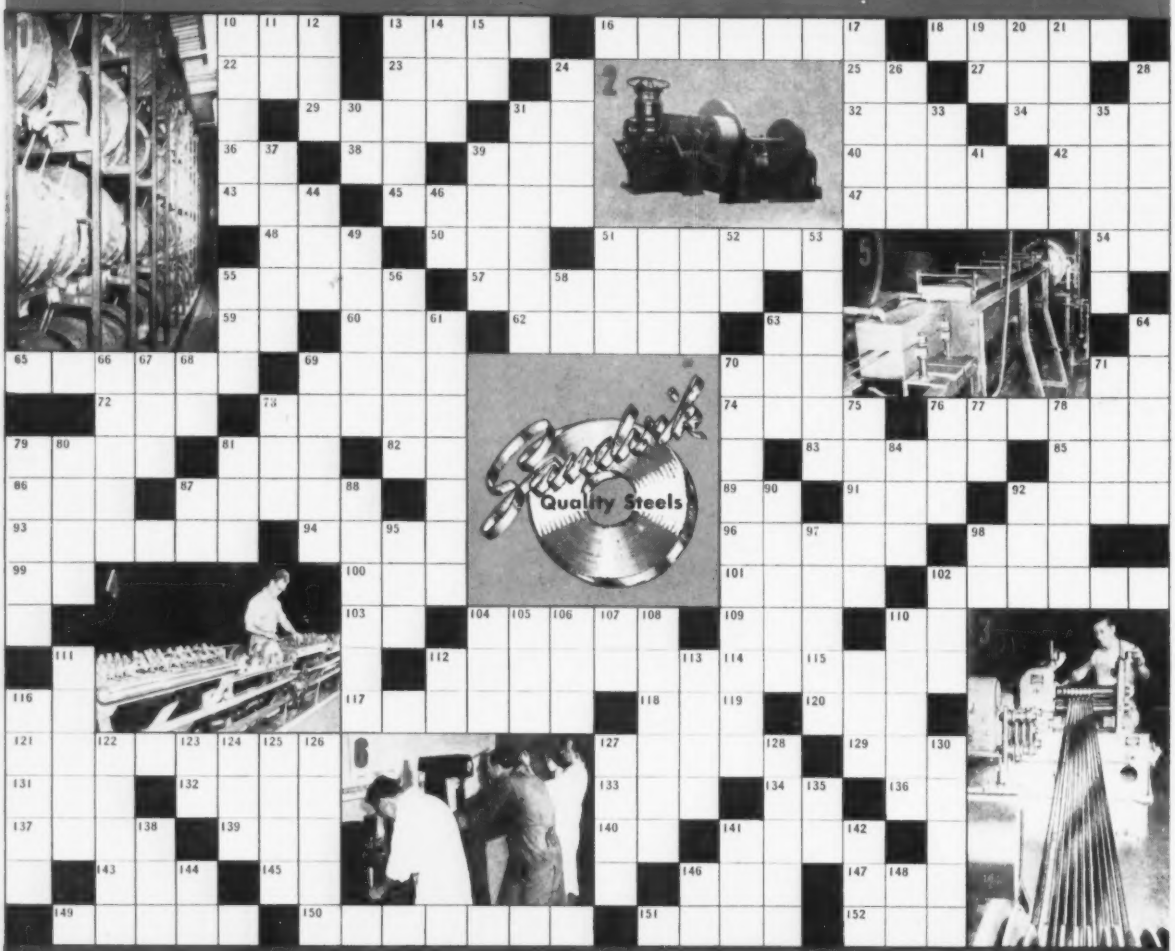
PITTSBURGH 22, PA. ..... 3 Gateway Center
HAMMOND, IND. ..... 518 Calumet Building
OAKLAND 12, CALIF. ..... 1924 Broadway

Kaiser Chemicals

Pioneers in modern basic refractories

REFRACTORY BRICK AND RAMMING MATERIALS • CASTABLES & MORTARS • MAGNESITE • PERICLASE • DEADBURNED DOLOMITE

SANDVIK Clues To The Solution Of Your SPRING STEEL PUZZLES



The pictures above give you some strong hints of Sandvik's ability to supply *exact* answers to your spring steel requirements.

Here's what they represent:

1. EXTENSIVE STOCKS OF SPECIALIZED STRIP STEELS – Cold-rolled annealed, unannealed or hardened and tempered, high carbon and alloy strip – in a wide variety of sizes, tempers and special analyses to fit specific performance demands.
2. ROLLING MILLS – To roll to order the precise gauge you require, if it's not available from stock.
3. SLITTERS – To tailor strip widths to your specifications.
4. EDGE FILING EQUIPMENT – To provide the edge finish required . . . square, round or dressed.
5. HARDENING & TEMPERING FURNACES – To give the proper degree of hardness and flexibility to the strip.
6. QUALITY CONTROL – To give a continuing assurance that Sandvik's high quality standards will be consistently maintained.

With these extraordinary facilities, Sandvik can supply the exact size and type of steel . . . either off-the-shelf or tailored-to-order . . . to suit almost any spring steel requirement.

For specific information contact your nearest Sandvik office.

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55-110

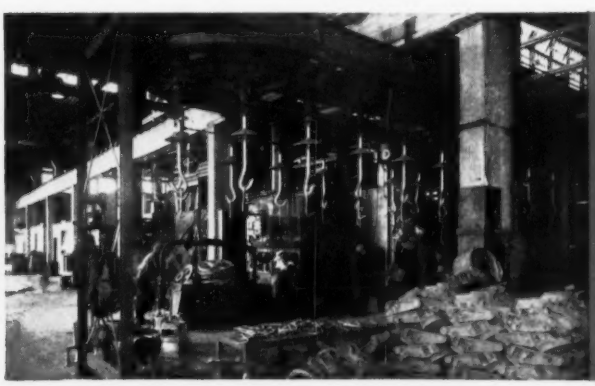
WHEELABRATOR® STEEL SHOT cuts abrasive costs for ALL TYPES of foundries

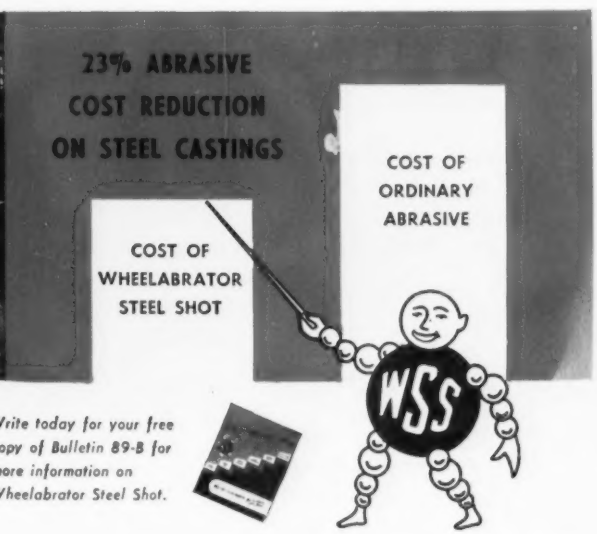
STEEL JOBBING FOUNDRY saves $8,000 a year

Tests made in a 3-wheel Wheelabrator Monorail Cabinet at Crucible Steel Castings Co. showed these results: In 322 hours, the 3 wheels consumed more than 19,000 lbs. of the ordinary abrasive that had been used. Abrasive cost averaged $1.578 per wheel hour for each wheel. In 202 hours, the machine used approximately 6,800 lbs. of Wheelabrator Steel Shot. Average abrasive cost was $1.215 per hour for each wheel. The Milwaukee steel foundry operates 10 wheels a total of 100 hours each day, so daily abrasive savings add up to $36.30, or about $8,000 a year.

Similar tests by other foundries have shown similar results — some making even more than the 23% savings registered by Crucible Steel Castings Co. Wheelabrator Steel Shot has brought abrasive savings and reduction in parts wear and maintenance expense to all types of foundries — steel, gray iron, malleable, large, small, jobbing, production, etc. Why don't you save with this versatile abrasive, too?

The findings reported above resulted from tests conducted in the Wheelabrator Monorail Cabinet shown below.





WHEELABRATOR CORPORATION

510 South Byrkit Street, Mishawaka, Indiana

Write today for your free copy of Bulletin 89-B for more information on Wheelabrator Steel Shot.

broken sardines and cut fingers

You avoid broken sardines and cut fingers when you open stubborn cans with their handy keys—keys which are often made from special uniformly tempered, low carbon CF&I-Wickwire Can Key Wire.

Chances are you don't need wire to make can keys. But *you may need one or more of the nearly 100 different categories of specialty wire for which CF&I-Wickwire is famous.* Let us show you how we can meet your most rigid chemical and physical specifications on high and low carbon wire in all sizes, shapes, tempers, finishes and grades.

Check This List!

FOR THE WIRE YOU REQUIRE, SEE CF&I-WICKWIRE.

FLAT AND SHAPED WIRES
Armor Wire
Bobby Pin Wire
Bookbinder Wire
Brush Wire
Casing Wire
Cotter Pin Wire
Curtain Spring Wire
Die Spring Wire
Gutter Broom Wire
Lock Spring Steel
Rake Tine Steel
Regulator Spring Wire
Snake Fishing Steel
Stapling Wire for Preformed Staples (Flat)

LOW CARBON FINE AND SPECIALTY WIRE
Bee Wire
Bonnet Wire
Bookbinder Wire
Broom Wire
Clip Wire
Dent Spacer Wire
Drapery Pin Wire
Florist Wire
Fuse Wire
Glass Netting Wire
Hairpin Wire
Hook and Eye Wire
Mattress Wire
Picture Cord Wire
Picker Tooth Wire
Pin Ticket Wire
Pin Wire
Ring Traveller Wire
Spiral Binding Wire
Stapling Wire
Stapling Wire for Preformed Staples
Stone Wire
Weaving Wire
Weaving Wire for Fly Screen Cloth
Wissco Iron Wire

HIGH CARBON FINE AND SPECIALTY WIRE
Aircraft Cord Wire
Armor Wire
Belt Hook Wire
Bobbin Ring Wire
Brush Wire (Tempered and Untempered)
Brush Wire (High Strain)
Chrome Vanadium Spring Wire
Core Wire (Aluminum Cable Steel Reinforced)
Curtain Spring Wire
Flexible Shaft Wire
"Gamma" Spring Wire (Upholstery Spring Wire)
Zig Zag Wire
No-Sag Wire
Hat Wire
Heddle Wire
Hose Reinforcement Wire
Hose Wire, Mechanical
Hose Wire, Vacuum and Defroster
Rope Wire
Signal Corps Wire
Spoke Wire
Hard Drawn Spring Wire
Oil Tempered Wire
Spheroidized or Annealed Spring Wire
Tire Bead Wire
Valve Spring Wire

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Basket Handle Wire
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Brush Handle Wire
"Cal-Tie" Wire
Can Key Wire
Case Hardened Ball Wire
Chain Wire
Clamp Wire
Clothes Pin Wire
Concrete Wall Reinforcement Wire
Garment Hanger Wire
Hay Baling Wire (Coiled)
Lingo Wire
Lintel Wire
Loop Wire
Merchant Quality Wire
Pail Bail Wire
Rivet Wire
Stapling Wire
Strand Wire
Tying Wire
Welding Wire
Wissco Iron Wire
Industrial Quality Wire
Cold Rolling Quality Wire
Heading, Forging or Roll Threading Quality Wire
Medium High Carbon Wire

CF&I-WICKWIRE WIRE

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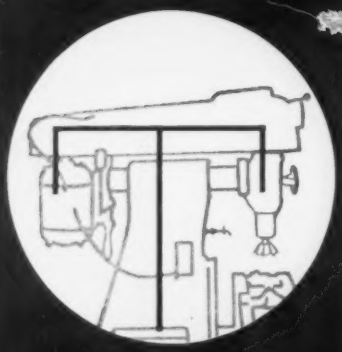
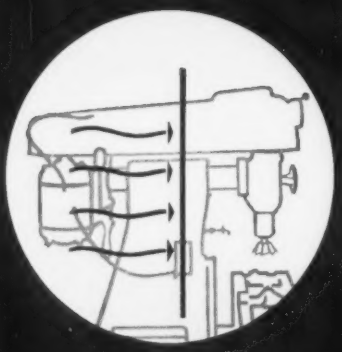
BALANCED RIGIDITY



Motor mounted behind column balances weight of head, minimizes deflection.

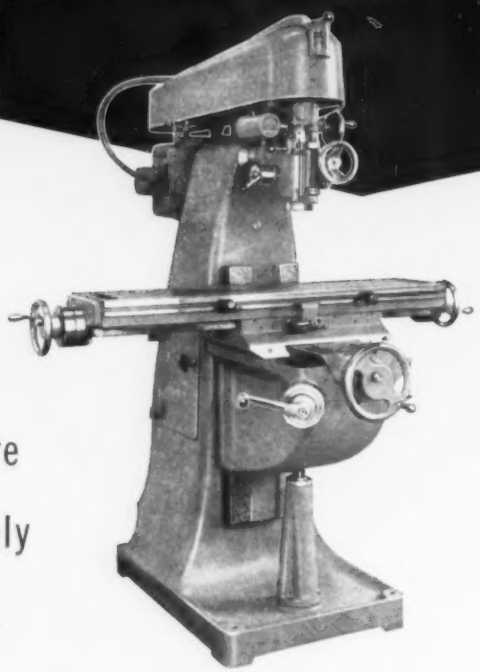
ISOLATION OF MOTOR VIBRATION



Column acts as baffle, keeping motor vibration away from head.

MORE EFFICIENT POWER TRANSMISSION

Wide belt spacing permits use of B-section V-belt, more wrap-around on pulleys.



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U.S. Vertical MILLING MACHINE

The *exclusive* motor mount design of the U. S. Vertical provides balance, rigidity and greater milling ACCURACY! And, check these ADDED features – all designed to aid in close tolerance work.

- Machine weighs 2000 lbs.
- Massive knee, saddle and table
- Extra wide bearing surfaces
- Tested and CERTIFIED ten ways
- Major castings are internally ribbed, normalized and stress relieved.
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MACHINE TOOL DIVISION

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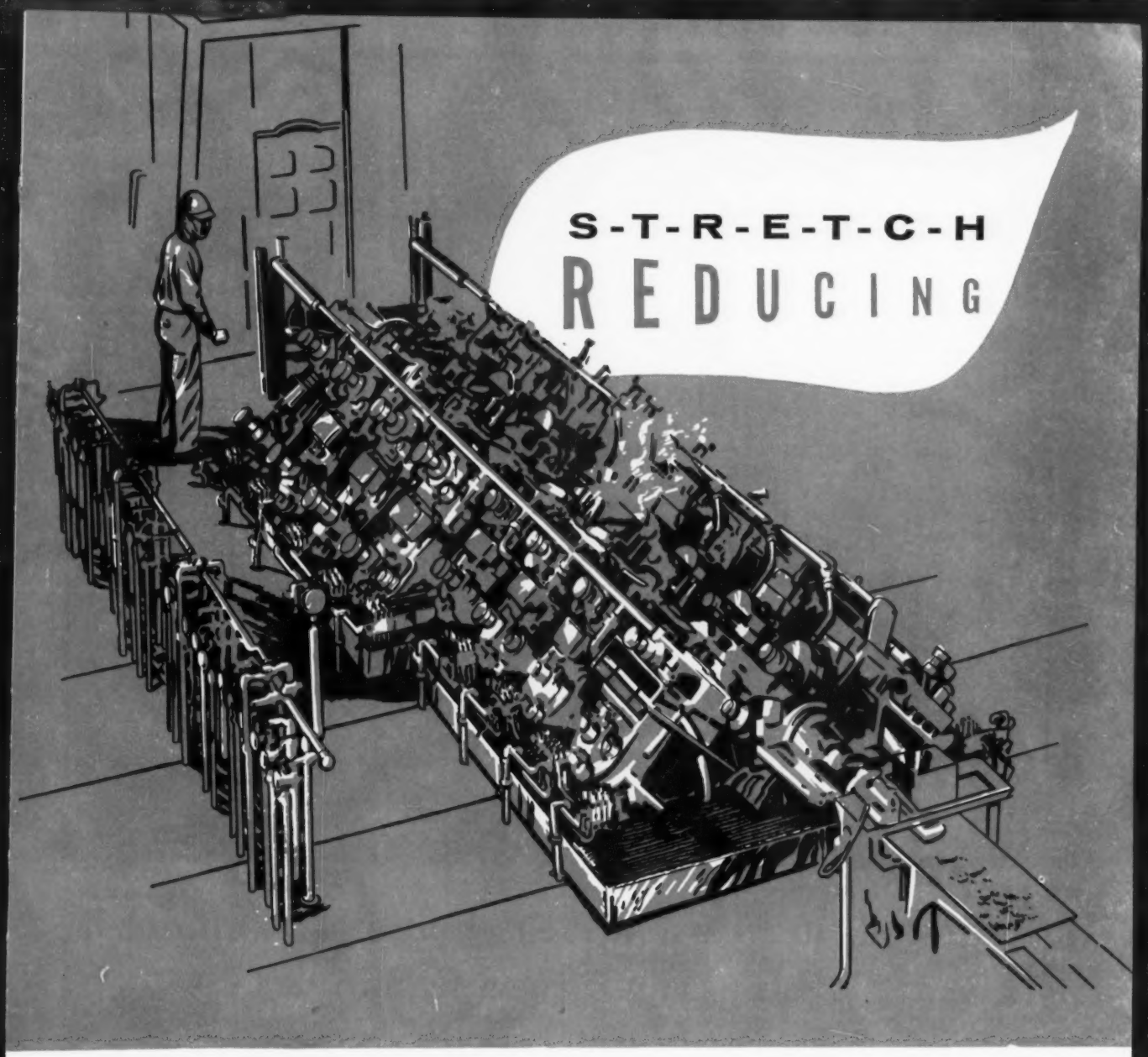


● Much of the news in Seamless concerns the Stretch Reducing principle. The first such mill was installed by National Tube Division of U. S. Steel Corporation. Aetna-Standard collaborated with National Tube in designing this mill and supplying the equipment. Since that time, much development work has been done on the equipment and the process.

Chief advantage of the Stretch Reducing method is the resulting increase in tonnage from existing Seamless Tube Hot Mill equipment for the production of A. P. I. steel tubing. Briefly, tubes of the larger O. D. (6″ to 7″) are produced through the existing Piercer, Plug Mill and Reelers, thereby obtaining a maximum number of tubes at an increased tonnage per operating hour.

Aetna-Standard has built and is building most of the Stretch Reducing mills. If your group needs facts on cost, design, yield and other information, Aetna's Seamless engineers can help you.

AETNA • STANDARD

THE AETNA-STANDARD ENGINEERING COMPANY

GENERAL OFFICES: PITTSBURGH, PA. **PLANTS: ELLWOOD CITY, PA., WARREN, OHIO**

CONTINUOUS GALVANIZING LINES • CONTINUOUS ELECTROLYTIC TINNING LINES • SIDE TRIMMING AND SHEAR LINES AND OTHER FINISHING EQUIPMENT • CONTINUOUS BUTT WELD PIPE MILLS • SEAMLESS TUBE MILLS • DRAWBENCHES AND OTHER COLD DRAW EQUIPMENT • ROLLS AND CASTINGS • EXTRUDERS, MILLS, PRESSES FOR RUBBER AND PLASTIC

Carbide *tools were born in an Ajax induction furnace*

Induction heating melting

AJAX

NORTHRUP

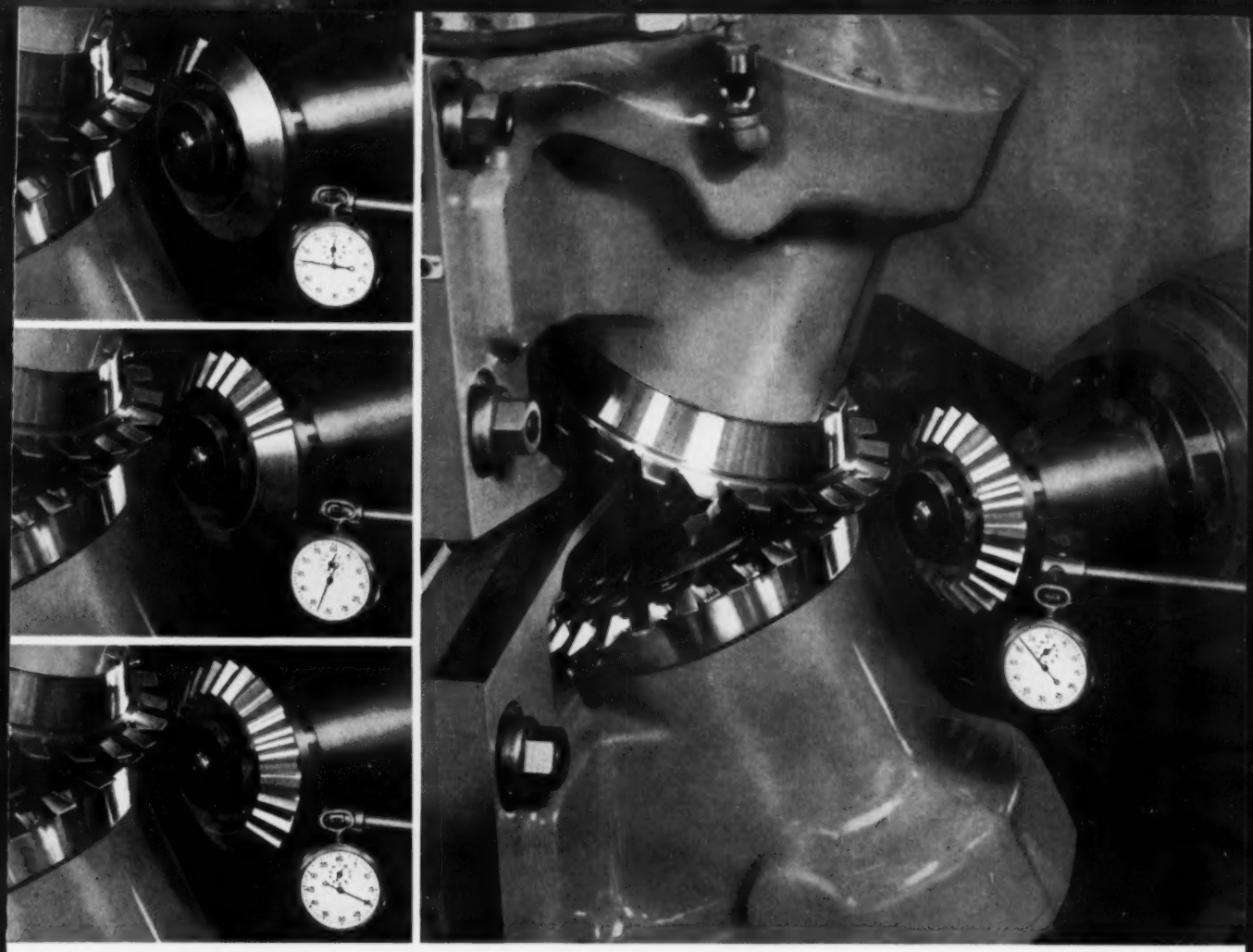
Carbide tipped tools provide industry with the hardest, toughest, most wear-resistant cutting edges in existence. But it wasn't long ago that the first commercial tungsten carbide—at $400.00 a pound—was created in the 2550°C. heat of an Ajax-Northrup induction muffle furnace.

Today, more than 85% of all the carbides used in industry are made, sintered, and hot pressed with induction furnaces especially designed by Ajax.

The fascinating history of induction heating and its unique application to melting, forging, and heating operations throughout industry are told in a new book. Write Ajax Electrothermic Corporation, Trenton 5, New Jersey, for your copy.

The Carbide industry is just one of many which owe their existence to Ajax-Northrup induction heat.

ASSOCIATED COMPANIES: AJAX ELECTRIC COMPANY—AJAX ENGINEERING CORPORATION



3 minutes-52 seconds, completed from the solid

You can cut gears 5 times faster!

You can increase production by as much as 400%.

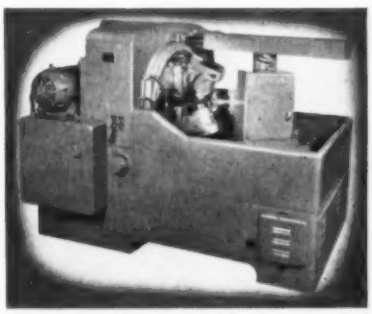
Your exact gain may vary with different gears, but in most cases this new generator will complete five gears in the time earlier models cut just one. The illustrations above show a 6 DP, 25 tooth, 7/8" face width, straight bevel gear completed from the solid blank.

The No. 104 Straight Bevel Coniflex* Generator completes each tooth in one rapid operation. A pair of multi-blade disc-type cutters combined with a cam-controlled machine cycle insures high efficiency, fine finish and maximum cutter life.

Easy to set up, the No. 104 has a wide range of capacity. You'll get the same excellent results for both small quantity jobbing work and volume production.

To discover other savings you can make with this remarkable Gleason Generator, simply write for descriptive bulletin.

*Coniflex® straight bevel gears with localized tooth bearings.



The Gleason No. 104 Straight Bevel Coniflex Generator cuts gears up to 8½" diameter, 4½" cone distance and 1⅜" face width, from 20 to 3 DP, ratios up to 10 to 1.

GLEASON WORKS

Builders of bevel gear machinery for over 90 years

1000 UNIVERSITY AVE., ROCHESTER 3, N. Y.

47

AMERICAN ORIGINALS IN IRON AND STEEL

The dry creek that stopped the furnace

In 1792, America's infant iron industry had spread as far west as Kentucky. In that year, a furnace was erected by Jacob Meyers on Slate Creek in Bath County.

The undertaking was a slow and laborious one. Essential supplies had to be packed through the wilderness. Timbers and stone were hewn and set by hand. Flash floods were a constant threat, and Indian raids an ever-present menace.

Finally, after a year of patient toil, the operation was completed. The great mill wheel churned, the bellows pumped and the furnace roared . . . but not for long. As the southern sun beat down, Slate Creek fell from a turbulent stream to a timid trickle. The mill wheel stopped, and so did production . . . until welcome rains once more filled up the dry flood gates.

Modern-day producers, of course, aren't exposed to such production hazards. But, there are others which you can eliminate by using Baker's MAGDOLITE. This carefully developed product will assure you of uniform ingots and lowest refractory costs. This is because MAGDOLITE has proved itself 5 ways better . . . in composition, preparation, strength, economy, and quality. Don't just say dolomite, specify Baker's MAGDOLITE . . . and be SURE!

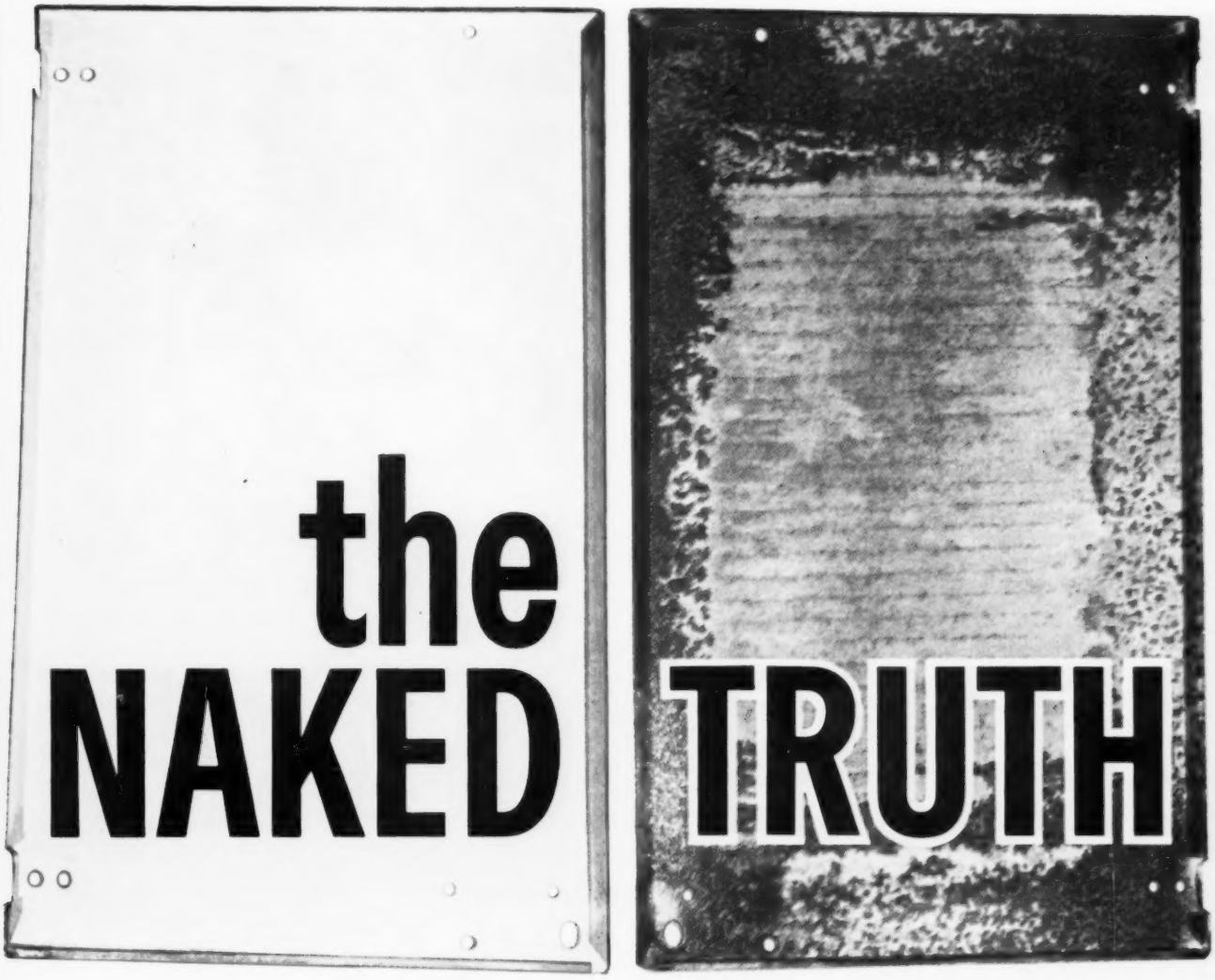
ANOTHER AMERICAN ORIGINAL

JEBCO
PRODUCTS
SINCE 1889

BAKER'S MAGDOLITE
The original dead-burned dolomite

THE J. E. BAKER COMPANY

YORK, PENNSYLVANIA • PLANTS: BILLMEYER, YORK, PENNSYLVANIA • MILLERSVILLE, OHIO



Even after a year's exposure to storms, salt and humidity on a Florida pier a two-piece hollow kitchen cabinet door of Weirzin electrolytically zinc-coated steel remained gleaming bright on the inside, and held its finish beautifully on the outside. Note what happened to the inside of the plain steel door that went through the same test. That's rust and lots of it . . . a completely ruined product both inside and out.

There's a profitable moral for *you* in that story—of a comparison test conducted by a leading manufacturer of kitchen cabinets for its own satisfaction. The moral: You can protect your products right from the start by using Weirzin right from the start. Its skin tight electrolytically fused zinc coating, uniformly applied, takes the toughest fabricating steps without peeling or flaking. Because it *does* stand up under the severest bending, drawing, crimping, flexing, you can forget coating or recoating—and its extra cost.

Furthermore, chemically treated Weirzin takes paint, enamel and lacquer beautifully, holds them indefinitely, eliminates underfilm corrosion.

Send for free booklet . . . get all the facts on Weirzin's many cost-saving advantages. Write to Weirton Steel Company, Dept. A-9, Weirton, West Virginia.

WEIRTON STEEL COMPANY

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

A DIVISION OF

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with the WALES FABRICATOR-DUPLICATOR

Punch accurate holes from any master template!

Holes in the template, mounted on the Duplicator, are automatically precision punched in the work piece . . . which is mounted on the Fabricator. Any size or shape hole within the limits of 3½" dia. can be handled on a quick change basis. Punch and die changes are made in seconds so that patterns with various size holes can be duplicated at high speed. This equipment is a complete punching shop in itself . . . fast . . . accurate . . . rugged and priced within the reach of any shop.

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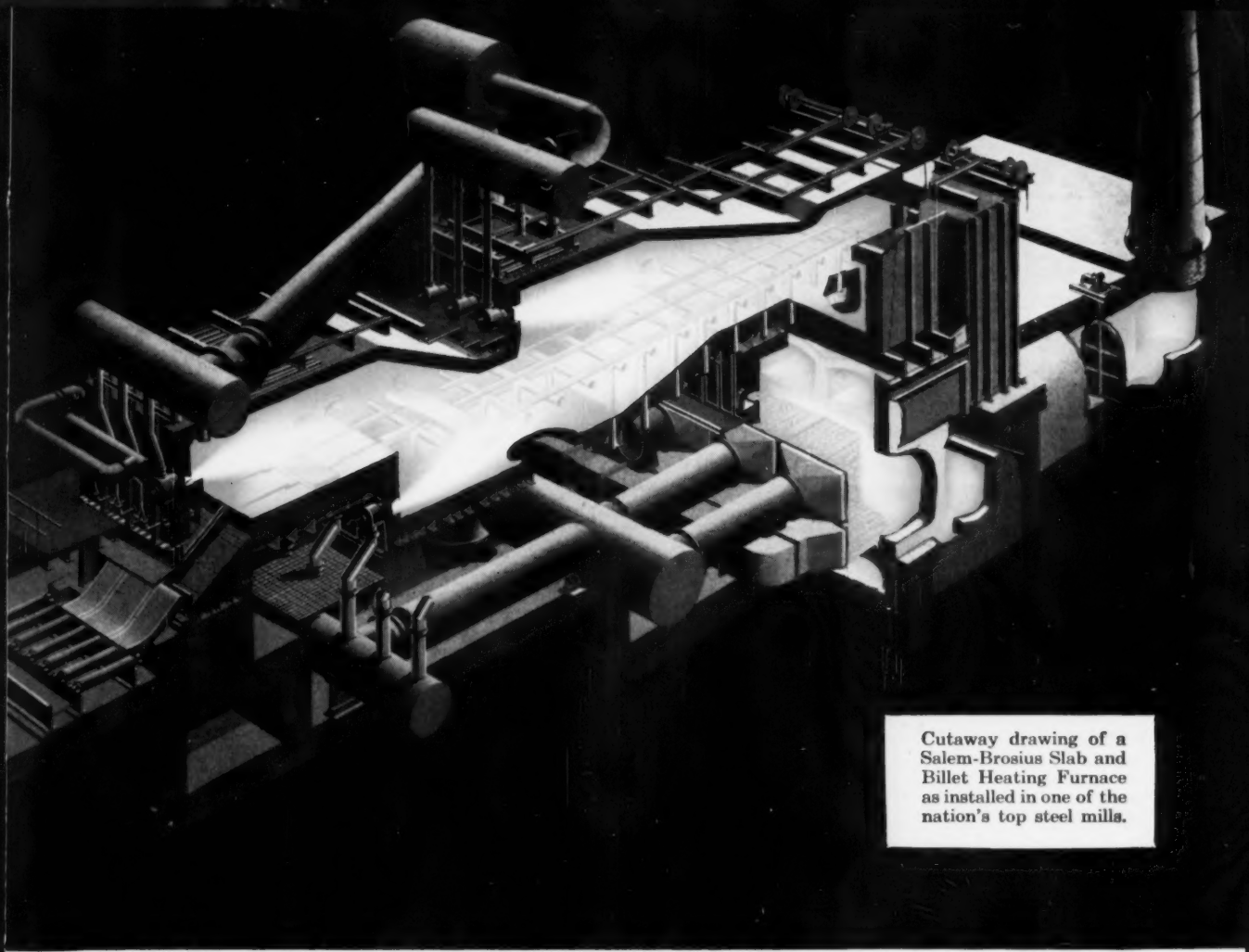


Cutaway drawing of a Salem-Brosius Slab and Billet Heating Furnace as installed in one of the nation's top steel mills.

In this Salem-Brosius furnace better steel products are born

All over the country, steel producers are turning to Salem-Brosius Pusher-Type Slab and Billet Heaters, because they have come to know that these furnaces will produce maximum tonnages of evenly heated, accurately temperatured steel at the lowest fuel consumption rate. The triple-fired furnace shown above features accurately controlled heating and soaking zones, heavy construction, recuperators for fuel economy, dual gas-oil fuel system, low maintenance cost, and many other advantages. These assure positive, automatic control of furnace output and heating quality.

And the efficiency, economy, ease-of-operation, and trouble-free service this furnace affords are typical of all the furnaces Salem-Brosius builds. Whether you require this or any other heating or heat treating furnace, Salem-Brosius offers equipment designed, engineered, and built not merely as a furnace but as a heating machine. You can purchase these furnaces as complete installations—equipped with all controls, piping and wiring—ready to operate. Write to us.

SALEM-BROSIUS, INC.

CARNEGIE, PENNSYLVANIA

In Canada: Salem Engineering Limited • 1525 Bloor Street West, Toronto 9, Ontario

SPECIAL MECHANICAL EQUIPMENT • INDUSTRIAL HEATING FURNACES • MATERIALS HANDLING EQUIPMENT

$280,000,000 Erector Set

But these Inland planners are not playing! They're studying a construction problem on a scale model of the steelmaking facilities being built as part of Inland's present expansion program. They're concerned that every penny in this $280,000,000 project be invested wisely to make more and better steels for your growing needs. Included are provisions for new open hearth furnaces . . . new slabbing mill . . . new cold rolled sheet department . . . and other facilities across the continent. By 1959, this program will have increased Inland's ingot capacity by 15%—to 6.3 million tons. Inland plans ahead today for the steel you'll need tomorrow.

INLAND STEEL COMPANY • 38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul • Davenport • St. Louis • Kansas City • Indianapolis • Detroit • New York

Paint First, Then Machine

Reversing the usual order of first fabricating, then finishing pays off sometimes. One Eastern firm paints its castings before machining them, finds it's quicker and cheaper than trying to mask off threaded holes and other machined surfaces. Chucking pressure doesn't mar the epoxy-resin coating, nor does the finish flake or peel off next to machined areas.

Easy on Openhearths

Two techniques for reheating openhearth furnaces after rebuilding or reroofing are attracting attention. At least two mills now spray new roofs with an insulating coating before reheating begins, and then hold a charge of light scrap in the furnace through the full cycle. Benefit claimed is better heat distribution.

Anyone For a Light Car?

Serious talk about an American-built light car has been revived in Detroit recently. With some models of so-called low price cars weighing 3600 lb, and fuel prices moving upward, the market for a light, rear-engine model is getting a long look. One possibility involves the use of a V-4 engine, with heavy emphasis on the use of aluminum for major components.

Freight Gets "Highball"

Faster freight service is on deck for shippers as railroads push modernization programs. Pennsylvania Railroad is spending $33 million at its Conway classification yard near Pittsburgh. New controls save as much as 24 hours per car, which should be good news for shippers. The railroad expects big savings, too.

More Manganese For Less?

Ferromanganese price, now at $255 per ton, could drop considerably if a new process pans out. Technique promises to smelt the essential and strategic ferroalloy from readily available low grade ore. It's claimed this will save up to $96 on each ton of ferromanganese. Average steels contain about four lb of manganese per ton. Some of the more highly alloyed steels require up to several hundred lb per ton.

Fight Scrap-Export Limit

The scrap industry doesn't want any part of U. S. Dept. of Commerce proposals to limit export of No. 1 heavy melting through a licensing setup. Dealers and brokers in port areas, especially, are angered. The Philadelphia Chapter of the Institute of Scrap Iron & Steel is preparing a strongly-worded protest. Other chapters are likely to follow suit.

Helps Melt Titanium

A British process extracts titanium to form small granules instead of sponge, the usual refining product. When pelletized, the granules ease problems in melting and pouring titanium. One plant is already producing upwards of 1500 tons of the metal annually by this modification of the sodium reduction process.

Fewer Planes, More Punch

Boosted firepower, not greater numbers, will typify Air Force fighter strength in the future. Most of the service's cutback to 128 wings will be at the sacrifice of fighter and fighter-bomber quantity. But more potent missiles will arm the trimmed-down fleet. Adding this heavier wallop makes it necessary to hold the 137-wing goal set in 1953, Air Force leaders contend. Cutback leaves tactical bomber strength virtually untouched. Only one of these wings will be dropped.

Cost-Cutting Twist

Twisted sections of precision rolled airfoil strip are big cost savers in the new gas turbine engine developed by Avco Corp.'s Lycoming Div. They provide the constant cross section blading used in the axial compressor, and reduce the cost of stator vanes from $10 each (as machined) to 35 cents apiece. Same technique promises to cut the cost of rotor blades from $14.50 each to $1.50. The non-tapered blades prove out well in performance tests.

Lubrication by Farval is automatic, too, on these Cross Transfer-matics

FARVAL—
Studies in Centralized Lubrication
No. 194

● Automation is the soul of Cross Transfer-matic machine tools. They do as many as 73 machining operations one after another on complex parts, delivering more than 100 pieces per hour.

Vital to continuous operation of these machines is the lubrication system. It, too, is automatic. It is Farval. With Farval there is no need to stop a machine for lubrication of even its most inaccessible bearings. And Farval ensures that every bearing receives the proper amount of oil or grease as often as needed.

More and more, machine designers, engineers, and production men are employing Farval to protect the large investments represented by automated production lines. Farval's own sales engineers are available and eager to work with industry to meet any and all problems related to centralized lubrication. For Bulletin 26-R and details of our engineering service, write The Farval Corporation, 3282 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm and Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

KEYS TO ADEQUATE LUBRICATION—
Wherever you can see these Farval manifolds, dual lubricant lines, and central pumping station, you know a machine is being properly lubricated.

Are Steel Users Hedging Against Higher Prices?

They Say No—But Stocks Are Rising

. . . By Teletype and Telephone —IRON AGE Editors Report:

DETROIT: "None of the Big Three is planning any kind of hedge buying against an expected steel price increase next July. Right now there is still a struggle going on to get inventories down as low as producers want them. As for automotive parts suppliers, most companies feel the same as the automakers."

CLEVELAND: "Purchasing agents here show little or no interest in stocking up in advance of the price increase. A large automotive supplier says there's no good reason to stock up because (1) higher steel prices will be passed along under escalator clauses, (2) auto production outlook is uncertain, and (3) storage space is at a premium."

WEST COAST: "Few purchasing agents are worried about the probable steel price hike. So there are few signs of any hedge buying here."

PITTSBURGH: "Steel users here are not planning to increase steel buying in anticipation of a July price hike. Those who have hedged in the past say it was more to insure supply in event of a strike than to beat the price increase."

CHICAGO: "No expectation of a wave of steel buying as a price hedge. General opinion is that if auto companies come back in April and May it might be a good idea to boost buying of sheets. But this stems from the fact that many firms are cutting inventory while their business is rising."

EAST: "Few purchasing men will admit to any second quarter hedge buying. Exceptions are users of plates and structurals, which are still in tight supply. Several large companies say flatly they are not planning hedge buying."

PHILADELPHIA: "Most steel users aren't planning to build up their inventories. They expect the price increase next summer may be as high as 5 or 6 pct. 'But that wouldn't be high enough to warrant the cost of carrying excess.' "

Purchasing agents are more concerned about high inventories than about high prices.

Overall inventories appear to be heading for a summer peak despite some cuts.

It's a question of choosing between the devil and the deep blue sea.

But an upturn in sales of consumer durables could give shot-in-arm to market.

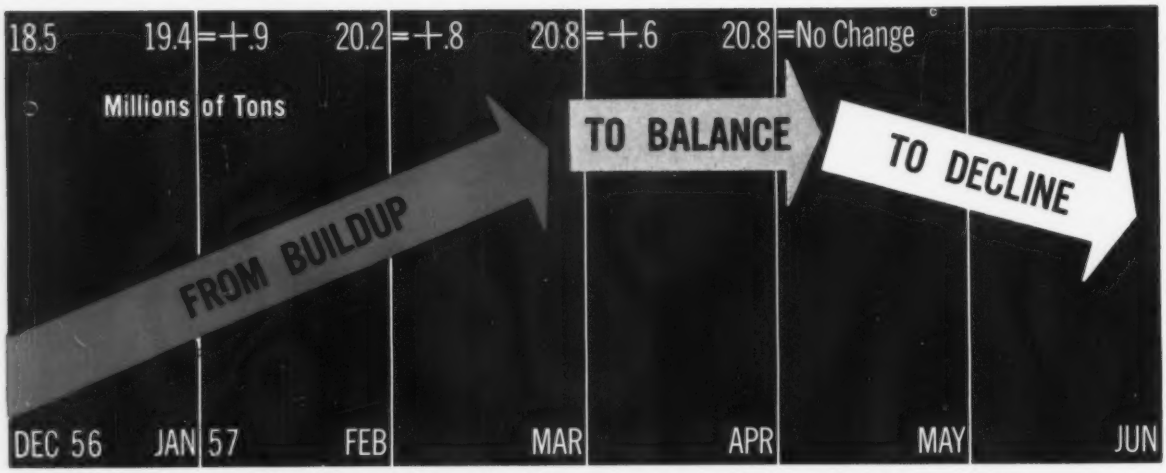
■ "It wouldn't pay us to stock up, especially with the high cost of money today."

"Last summer before the steel strike we did some hedge buying and found that some items adjusted pretty well. In other places we had big lumps of stuff laying around."

How Users Feel—Comments like these sum up the feeling of steel users in response to the question: "Do you plan to stock up on steel as a hedge against a probable price increase next July?"

In a coast-to-coast survey, IRON AGE editors found steel purchasing agents largely disinterested in building heavy inventories prior to the summer price hike. Some thought they could pass along the increase to their customers. Others felt the cost of warehousing would balance off an expected price boost of $5 to $7 per ton.

Big Reason Why—The three-year labor contract in steel, guaranteeing continued production this year and next, plays a significant



STEEL INVENTORIES: Include steel shipped and in process of manufacture at customer plants.

role in the thinking of steel buyers. Apparently, winter and spring inventory buildups in earlier years were a hedge more against a possible strike than higher prices.

This order-as-needed attitude applies only to those products in relatively easy supply. Users of plates, structurals, oil country goods, and linepipe are still anxious to take in all the steel they can get—but for a different reason than prices.

Overall Stocks Are Up—This probably accounts for the fact that overall steel inventories are still on the rise—although the pace is slowing. And a strong upturn in appliances, automotive, and other consumer durables could reverse the pattern.

But, for the moment at least, price hedging has been put on the shelf. Steel users in the Pittsburgh area come up with some potent reasons against stocking up:

Tight Money Again—(1) Cash can be used more profitably in other ways; companies that don't have cash face high interest rates when they borrow; (2) the steel price hike may be fairly small ($5 to $7 per ton, one company estimated); (3) tight money is holding down buying at some companies; (4) steel inventories are still high in many cases; and (5) purchasing agents are not afraid of being caught short even if the steel market should catch fire later in the year.

If there is any hedging, it's among users of more expensive steels—alloys and stainless. They are more likely to be hit harder.

Midwest Turnabout? — In the Midwest, the general feeling is that if auto companies come back in April and May there would be a turnabout in policy among sheet users. But this stems more from the fact that many firms are still cutting inventories even though their own business level is on the rise.

Users in the Detroit area commented often about the expense of storing heavy inventories. The old bugaboo of age hardening (loss of ductility during storage) also makes consumers hesitate to stock up when price is the only incentive.

Meanwhile, everybody talks about cutting inventories — and quite a few are—but it doesn't show up in the overall statistics: Steel shipments still exceed steel consumption.

Room For Debate—Apparently, steel users are busy screwing down the valves but haven't been able as yet to reverse the flow. Some analysts believe significant cutbacks in overall inventories won't begin to show up until early summer.

Many knowledgeable observers will contest this inventory theory hotly. What beclouds the question is whether cutbacks in flat-rolled orders are enough to offset the surging demand for heavier steel shapes.

The Sleeper—Sleeper in the overall inventory picture has been steel shipments. In January and February steel products poured out at a rate close to 8 million tons a month (adjusting February for fewer days). March figures point to an output of 7½ million tons.

Meanwhile, steel consumption has been holding steady at 7 million tons a month. Subtracting steel consumption from steel shipments gives an inventory buildup of more than 2 million tons during the first quarter. Which means that steel users are back almost to last June's record pre-strike level.

July Turning Point?—Steel analysts contend you don't go from an inventory buildup to a cutback overnight. In mid-1953, all signs pointed to a reduction of steel inventories. There were reports that this was taking place. But it was not until 1954 that steel users really pulled in their horns.

The economists say it takes from six to nine months for an inventory trend to reverse itself. They are talking of July as the turning point. But they admit they have never been able to spot in advance the exact timing of a new swing.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

More Nickel Is on the Way

Stockpiling Policy Is the Big "If"

Producers are pushing toward big capacity peak in 1961.

Some new metal will hit the market sooner, to brighten the pre-peak years.

Inco's 3-pronged project looms as biggest factor.

▪ The look-ahead year for U. S. nickel consumers is 1961. By then major expansion projects will be hitting on all cylinders.

The outlook from 1957 to 1960 is hazy and full of question marks. Nickel producers are non-committal on many details of their plans. But, everything considered, consumers can expect a gradual increase in nickel capacity in the next two years, a big jump in 1960, and an even bigger one in 1961.

Biggest Factor—International Nickel projects will be the major influence. The company says it will boost capacity by 130 million lb, to 385 million lb by 1960. Part of this increase will come from an expansion program now underway at Sudbury, part from the Manitoba project, and part will be premium nickel formerly mined and refined for the stockpile.

At Manitoba, $175 million will be spent for a railroad, mining equipment, expansion of initial mining operations, concentrator, smelter, refinery, and a town.

Freeport Sulphur Co. will spend $100 million for a similar, but less extensive, project in Moa Bay, Cuba. It will produce 50 million lb of nickel annually.

Considering all variables between the two projects, it is likely Inco will get 70 to 80 million lb from Manitoba.

Start In 1960—Most of the Manitoba capacity will be brought in at about the same time, when the planned smelter and refinery begin operations sometime in 1960.

The 20 million-odd pounds increase in Sudbury output will probably be felt slightly in 1958, more so in 1959, and contribute heavily to the big boost in 1960.

Delivery of 24 million lb per year of premium-priced nickel from high-cost Inco operations to the U. S. Government will end in 1958. This will be sold to industry.

More From Nicaro—At the government-owned Nicaro, Cuba, plant, capacity has just been upped to 50 million lb. Output for 1957 will be about 39 million lb, compared to 32 million lb in 1956.

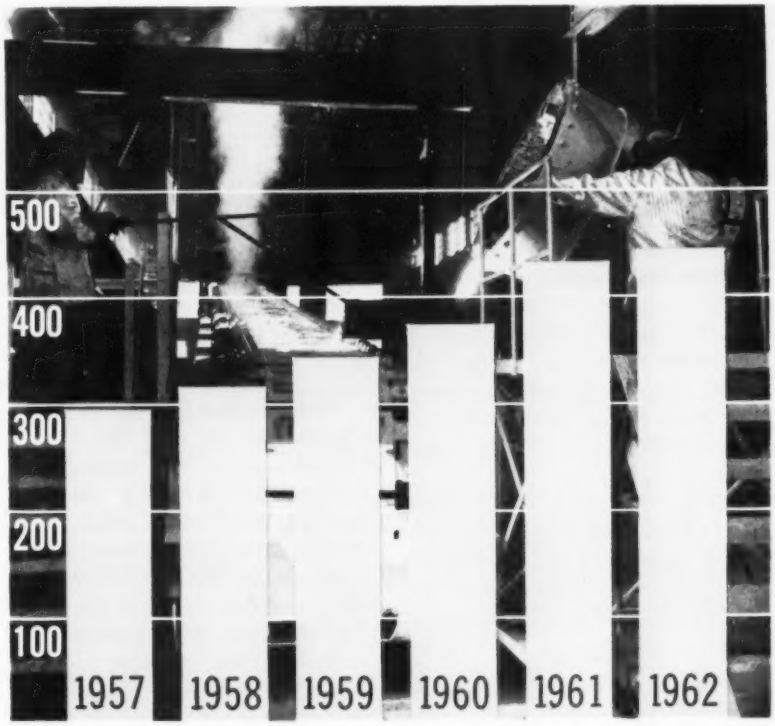
American Smelting and Refining Co. has an option on, and is exploring a site in Ungava, Quebec, reputed to contain "one of the biggest nickel ore bodies in Canada." Company says if its investigations pan out, it will go into the business.

Freeport's Cuban project will not put nickel on the market until 1959. If current plans are unchanged, Freeport will ship about 18 million lb in 1959, and full capacity of 50 million lb in 1960.

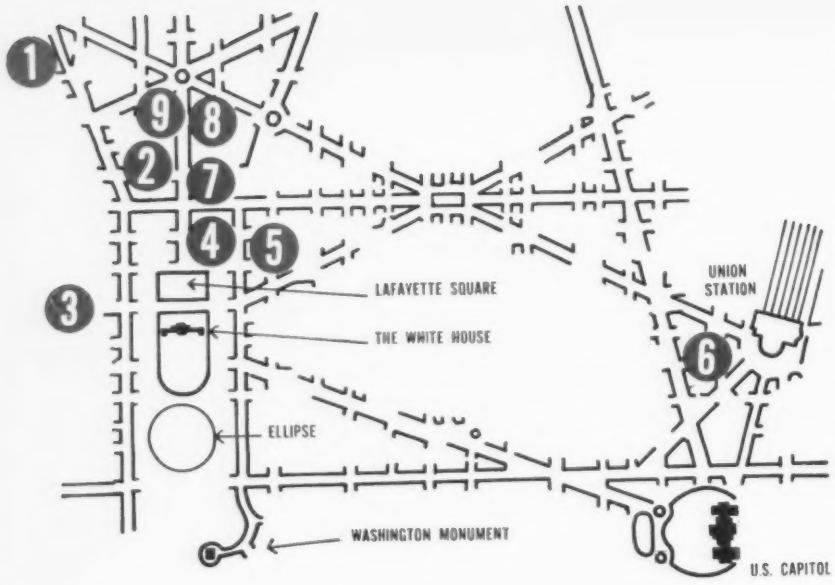
Big "If"—Big factor in how much Cuban ore, from both properties, will reach the market is government stockpiling policy. The government has the right to take all Nicaro production, 30 pct of Freeport output.

Falconbridge, and Sherritt Gordon, Canadian mines, produce about 62 million lb combined. Two-thirds of this crosses the border, but much goes to the stockpile.

Nickel Future Looks Good for Industry



Projected Deliveries (millions of lb)



Union Headquarters Surround White House And Capitol Hill

1. International Association of Machinists, AFL.
2. International Union of Operating Engineers, AFL.
3. National Federation of Federal Employees, Ind.
4. AFL-CIO Headquarters.
5. Bricklayers, Masons, Plasterers, AFL.
6. Teamsters, AFL.
7. United Mine Workers, Ind.
8. International Brotherhood of Electrical Workers, AFL.
9. International Union of Electrical, Radio and Machine Workers, CIO.

Labor Concentrates Its Strength

Labor has had its political setbacks. Senate hearings leave plenty of red faces.

It's only temporary. Labor leaders have strong political plans and the organization to make them work.

Michigan is a blueprint of labor's successful tactics which extend to Washington.

▪ Labor is still reeling from a combination of body blows. In recent days it has seen its reputation damaged, top officials smeared, and its political effectiveness threatened.

What hurts most is that they came from directions where labor considered itself least vulnerable—the Halls of Congress and the rarified atmosphere of the Supreme Court.

Damaging Testimony—Everyone is familiar with the sordid details uncovered by the McClellan Committee in the Senate. Hearings were first referred to by reporters as the Capitol Hill Girlie Show. Then, with the arrest of the Teamsters' second-in-command on bribery charges, the hearings became "Hoffa's Follies."

Less spectacular in the glare of publicity was a Supreme Court decision remanding to the Federal Court in Michigan a case against the United Auto Workers. It means that the UAW will have to face trial on charges of using union funds for political purposes.

Example in Michigan — Significance here is that the UAW's political action in Michigan is generally considered a prototype of labor's political effectiveness. Much TV and radio time was brashly purchased by union funds. An adverse decision (and Supreme Court language indicated the probability) would seriously hamper political activity of the UAW or any other union seeking to follow its course of action.

But in spite of the series of knockdowns before the public and the loss of a big round before the court referee, labor's political influence is not on the wane.

Action in Washington — It has its concentrations of power in Washington itself, in the shadow of Washington Monument and scarcely a good golf shot from the White House lawn. Equally significant are the grass roots political organizations that provide financial and organizational support for favorite candidates, whether city hall, national, county, or state.

The landscape of the nation's capital is marked by the slick, large, and well-appointed buildings of the leading labor unions. A total of 48 national unions have their headquarters in Washington. The National Association of Manufacturers estimates that unions own more than $33 million of property in the District of Columbia.

There's no doubt that, paraphrasing a statement by George

AFL-CIO: Headquarters are within sight of White House.

in Capital

Meany, president of the AFL-CIO, labor considers its first line of offense and defense where the nation's laws are made and executive policy formulated.

Right-to-Work Issue — For the time being, much of labor's political activity has shifted from the nation's capital to the capitals of the various states. This is because of the controversial right-to-work laws that are in effect, mostly in southern states, although Indiana only recently adopted a right-to-work law.

Labor's first action was to take the offensive, to get existing right-to-work laws repealed. But it is now on the defensive in states where right-to-work laws have been proposed.

Remember 14-B — In review, right-to-work laws are state laws which prohibit the union shop, or compulsory union membership. States are specifically granted the right to pass such laws in the now famous Section 14-B in the Taft-Hartley Act.

So labor's political activity today is centered on Section 14-B in the halls of the U. S. Congress, and against right-to-work laws in the respective states. Objective is the same, but effort is on both national and state levels.

Mitchell's Position — Labor's Washington offensive doesn't stop on Capitol Hill. Nor has the door of the White House been completely closed to Labor since 1952. Secretary of Labor James P. Mitchell is not unfriendly to labor and, in fact, actively and successfully sought labor support in the last election.

The Labor Secretary is actively seeking amendments to Taft-Hartley, but will not go for elimination of Sec. 14-B, although at one time this was considered a likely possibility.

Speaking before the Chamber of Commerce National Labor Relations Conference last week, he said he "never questioned the rights of states to pass right-to-work laws." He pointed out that his recommendations to Congress contained no reference to Sec. 14-B.

T-H Action—"But," he said. "I have questioned the wisdom of right-to-work laws. I don't think they are good laws."

Sec. Mitchell says it is a "common error" to relate national labor policies to Taft-Hartley. "Taft-Hartley is merely the rules of the game in collective bargaining. The trouble with T-H is that it has become a political and emotional document. I have attempted to place it in its proper perspective," he declared.

John Feikens, until recently GOP state chairman of Michigan, pointed out, in discussion of labor's political activity, the success of the UAW in winning elections in Michigan.

Felt Buzz-Saw—He charged that businessmen are defaulting in not taking an active part in political activity. After two terms of unsuccessfully bucking Governor G. Mennen Williams, who benefited from the UAW's heavy spending, Mr. Feikens admits he "felt the buzz saw," of labor's political action.

"You can count on one hand the bright, young businessmen in Michigan who are active in politics," he said. "But Solidarity House (the UAW's plush Detroit headquarters) is full of dedicated men who are active in politics."

The UAW is alleged to have spent more than $2.5 million in educational funds in Michigan in 1956.

"The effectiveness of unions in politics is to get its political action in front of the people," Mr. Feikens points out. "Be alert to the fact that Walter Reuther is adept at educating his members to his way of life —through the use of union dues."

TEAMSTERS: This spacious $5 million building is their operating center.

FIRST REACTOR: Highlight of 1957 Nuclear Congress was first reactor operated publicly in the U. S.

How Industry Sees Atom Foul-Up

Private industry takes offense to charges it is hindering nuclear power development.

Criticism by top government official boomerangs. Technical problems cited.

Controversy was triggered by Admiral Rickover's complaints about components quality.

▪ If American industry is lagging in developing nuclear power the fault probably lies elsewhere, not with industry. You must have come away from the 1957 Nuclear Congress last week in Philadelphia with a feeling that industry is well aware of the problem. (See p. 81.)

AEC's Rear Admiral H. G. Rickover has charged that industry's meager knowledge of such basic techniques as stainless steel welding is largely responsible. (THE IRON AGE, Mar. 14, p. 94.) Some exhibitors at the show took violent issue with the admiral. For obvious reasons, none would speak for direct quotation.

They say — "We're spending a lot on research right now. Until we can see more sales potential we can't up the budget."

"Perhaps the admiral is right. Maybe we're trying to build reactors like Swiss watches. 'The desire for perfection is the greatest single bar to progress.' "

"If AEC wants more research—and I'm not sure Rickover speaks for the whole Commission — let them give us a contract."

"When you start welding a stainless-clad reactor head 9 in. thick you have a special problem," said one. Said another, it takes over 2 months to calculate the stresses in a conventional high pressure steam plant—what do you think is involved when you pump corrosive radioactive sodium through a heat exchanger?"

Impact Overseas—"Just ask the admiral who but American industry was responsible for producing A-bombs as fast as we did during the war," said an engineer for a big AEC contractor.

But Admiral Rickover got support from another quarter — from Robert McKinney, who was chairman of the Citizens Panel on the Impact of the Peaceful Uses of Atomic Energy. He declared that Europe desperately needed atomic energy right now: "I cannot avoid the feeling that the free world's failure to press forward vigorously with the construction of nuclear power plants . . . made the Suez situation . . . inevitable . . ."

Interest Is High—In view of this he is "surprised" by the leisurely fashion in which American industry is picking up the responsibility for research in the power field. But he questioned whether the attitude of Congress or the AEC was such as to justify expansion of private research activity.

Is industry really interested? The Congress heard 166 papers; there were 118 exhibitors at the show and over 15,000 visitors — excluding students and deadheads.

One thing was apparent at the show. It's a young man's field. Those manning the booths and answering technical questions were mostly young timers who got their early training at the AEC or came straight from science courses.

Cutbacks Hit Steel Founders

Inventory Control Hurts Here Too

Overall demand for steel castings is good. But founders are feeling the pinch.

Answer must lie in customer inventory policies.

Sales executives hope worst will be over by April. Second half should be even better.

▪ Is anything really wrong in the steel castings picture?

The backlog of orders for steel castings slipped another notch this month. From the strong figure of 558,000 tons in October of 1956, the backlog has slipped to 522,000 tons at the beginning of this January.

Business Hurts—No doubt about it. Ordering is off and the backlog is continuing to move in the wrong direction. Steel castings producers are expressing some concern over the 1957 business outlook. Nevertheless, as steel foundrymen met at Chicago early this week, there were several heartening signs in the business weather forecast.

Not everybody is in trouble. While new orders for some major steel casting concerns are currently running 20 pct below the year-ago period, others are exceeding it by at least 10 pct. While some backlogs have fallen to 30-45 days, a few have advanced into the 60-90 day bracket. Several steel foundries sampled have slipped back to a four-day work week. Others are holding their own.

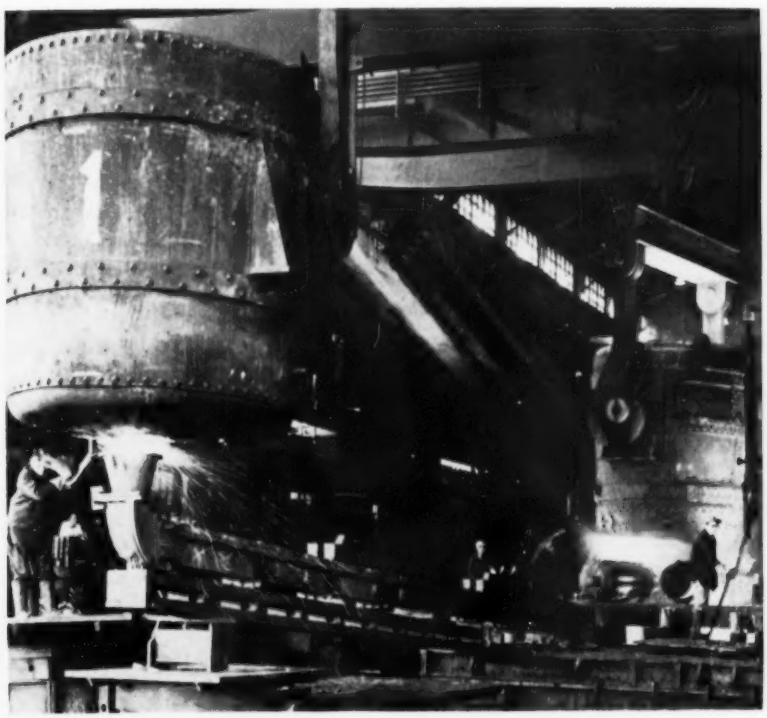
Inventories Cutback—The basic difficulty, most foundry sources agree, is not customer demand as much as it is customer inventory. Customers are using up stocks of castings shipped during the boom second half of 1956. Their own business may be good, but they know when they've boosted inventory too high; and they are doing something about it.

The inventory cutback has been a long time in coming. It's worth noting that steel foundries which now report rising business levels are in the group which suffered a decline last fall. At that time, their own customers began an early inventory cutback. While the steel castings industry hit an October peak in tonnages shipped, business for this segment of the industry wasn't particularly good. At the moment, they report their customers, particularly those in the marine or construction equipment fields, are boosting their order volume.

Better in April—Most industry sources believe the current inventory reduction of steel castings by their consumers will continue through April. During May and June, historically peak months for first-half tonnages shipped by steel foundrymen, inventory correction will be achieved.

If May and June do not show an immediate recovery in demand, sales chiefs believe that a strong need for steel castings will be deferred into second half. Steel castings in the past have demonstrated that the annual sales peak may occur in second half of any given year.

Chief source of complaint, currently, is erratic action of light castings, those under 10,000 lb in weight. Backlogs range up to 10 weeks, but this commonly heard figure is "30 days or less." Large castings are pacing the field. Though they can be obtained on as little as 45-day delivery, much space has been booked through May and June already.



BUSY TIMES: Steel foundries are still operating at top speed, but slipping backlog has foundrymen worried about future.

Everybody Talks About It—But

Chances of a Budget Cut Are Slim

There's lots of protest about the biggest peacetime budget in U. S. history.

However, when shouting's over, we'll probably settle down to live with the proposed $72 billion measure.

Most likely candidates for paring are foreign aid and school construction plans.

▪ Indignation over the biggest peacetime U. S. budget ($72 billion) is both widespread and genuine. Pressure is on from all sides for cutting down the skyhigh level of government spending. And most congressmen are convinced it's a grass-roots protest, not an artificially staged campaign by pressure groups.

The politicians, ever sensitive to the public pulse, have picked up the popular chant. But behind all the protest talk in the halls of the Capitol, congressmen say the President is right when he declares that the people want and demand the $72 billion worth of security (all types) the budget provides.

Any Cuts Shortlived—So despite all the protests, the U. S. will probably settle down with this largest peacetime budget, plus a few billions more for social security and highway programs, in the fiscal year beginning next July 1.

And by the time the end of the next fiscal year rolls around in 1958, chances are that spending will be as high, or higher, than the President is asking. Whatever cuts are made this year—and they'll probably be slight—will be mainly restored through supplemental appropriations next year.

Politics is the overriding answer to budget-cutting fever.

Pass the Buck—A congressional move to put a legal limit of $65 million on the federal budget started out bravely, but ran out of steam. Now the lawmakers have told the President if he wants cuts, he'd better suggest where they should be made. Congress will be glad to oblige.

And the philosophy of both President and Congress is the same: Cut the budget, but don't kill off any of our programs.

Clearly there's no shortage of fat in the budget. Excluding defense spending and expenditures fixed by law, there's a portion of 12 pct which might be pared. One proposal, politically impossible, is to just cut 10 pct off all agency appropriations. Thinking goes this way: If the Pentagon can defend us for $38, they can do the job for $35 billion.

No Major Surgery — This cut would mean a created surplus of over $8 billion, enough to finance a general tax cut. However, such across-the-board budget - butchery would be open to severe criticism. It won't be used.

President Eisenhower, who's already seen the House pare his request for funds to run his executive offices by $4.5 million is striving to protect two of his projects. These most likely candidates for cutting are foreign aid and school construction.

Little Hope—The major problem in any budget-cutting is that few of those clamoring for action will single out which programs should be left behind.

How Strong Is Economy Drive?

Strength Absent—Is the present budget-cutting drive in Congress serious?

When individual members are considered sentiments are pretty strong, but as a unit Congress is much more lukewarm.

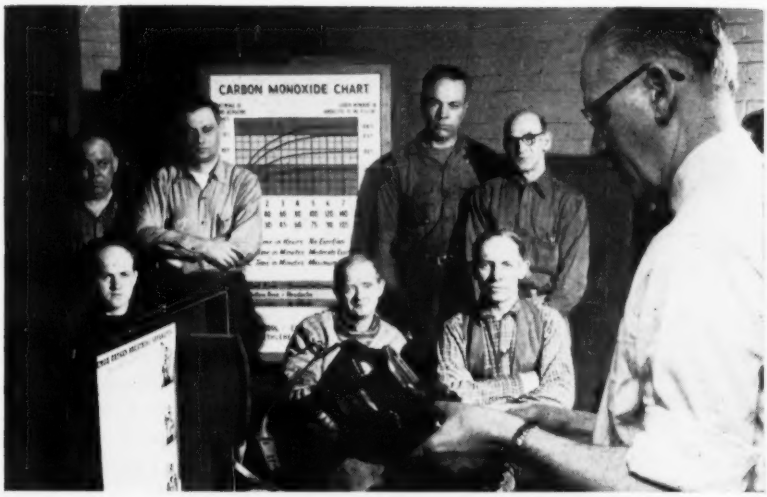
Change of Heart—Congressional temperature change on budget-paring can be judged by statements made by Rep. Sam Rayburn, Democratic House leader.

Initially he declared he had "serious doubts" that the budget could be cut substantially. "You can talk all you want about cutting the budget by $5 billion, but it just isn't going to be done," he added.

However, later he said Congress may well cut the budget substantially—"I certainly hope they do."

Strong Pressure—Meanwhile the pressure on Congress to do something about the budget is growing with businessmen in the forefront of the drive. The U. S. Chamber of Commerce held a protest meeting. The Council of State Chambers of Commerce listed areas where it felt cuts could pare $4.5 billion from the budget. The group maintains another $3 billion could be saved in military spending. The National Association of Manufacturers believes cuts totaling $8.2 billion could be made without injury to the nation.

Budget cuts of at least $2-3 billion would be needed before Congress could vote any meaningful tax cuts. And there's no real pressure for reductions of this size at the present time. There might be if business should slide off sharply, but that's not likely.



BRIEFING SESSION: Employees receive instruction in care and use of respirator equipment at one of Bethlehem's gas protection classes.

COMPETITION: Plant teams vie **for prizes on their first aid skill.**

How To Sell Safety To Workers

With industrial accidents costing $3.6 billion in '56, worker safety is important.

Bethlehem won the battle by making safety a part of its production philosophy.

▪ Make safety one of your production tools. That's the concept Bethlehem Steel has stressed over the years. And it's paid off handsomely.

Winner of many safety honors, the company holds the all-time plant record in the steel industry of 8,241,906 worker operating hours without disabling injury. In National Safety Council contests, Bethlehem has won first place in the steel mill division for fourteen straight years. In seven of those years it made a clean sweep by also gaining second and third place.

Concentration Is Byword—Taking Bethlehem's 1916 accident statistics as 100 pct, there's been an impressive drop of 92 pct over the years to only 8 pct last year.

Such records indicate Bethlehem's intense concentration on safety. "In the Bethlehem organization," says President A. B. Homer, "safety is not a separate endeavor but an integral part of production."

The company's philosophy is this: Don't aim for production and safety, but for production with safety. When this is achieved the result has got to be production with efficiency. A poor accident record indicates poor industrial thinking. It shows there's something wrong with job procedures, layout or equipment, employee training, supervision, or the employee himself. A good safety program, by showing how to avoid unsafe practices, can actually improve production.

Hard Sell—How does Bethlehem promote safety? Briefly by selling it through literature, posters, pamphlets, motion pictures, and other methods. **By regarding the foreman as the key to acceptance of the idea by employees.** By job safety analyses—studies of ways to eliminate or control the hazards on every job. By treating every accident, no matter how trivial, as though it were serious and investigating it thoroughly. By stressing competitive first-aid contests among various plant teams. And by paying attention to good industrial housekeeping.

Talk It Out — Another useful technique at Bethlehem is short on-the-job talks between foreman and employees. It's found that once these contacts are established any misunderstandings about the program's objectives fade.

Foreman's Checklist For Safety At Bethlehem

Instructing workers on the mechanics and hazards of jobs.

Explaining and enforcing safety rules.

Holding group meetings to discuss new job hazards.

Studying jobs to develop methods for controlling or eliminating safety hazards.

Conducting on-the-job safety talks with workers.

Knowing what protective equipment is required.

Seeing that safety equipment is used and properly cared for.

Making sure that "good housekeeping" is practiced.

Reporting and investigating accidents to discover the cause.

Putting a Kick Into Fasteners

Powder-actuated Tools Aim for Record

After several false starts, powder-actuated fastening is riding the crest.

Will blast off from 1956 sales record to new high in 1957 says the industry.

Makers shooting for new fields to conquer.

■ Industry acceptance of powder-actuated fasteners is still climbing steadily.

The World War II baby, which had trouble getting started in peacetime, registered an all time sales high of $6.9 million in 1956.

The new record is not expected to stand long. The industry estimates it will rack up sales of $9.5 million in 1957.

Seek New Fields—"Refinements and technical know-how have been developed to the point where the industry as a whole can now expand into more diverse fields", says Clarke Tryon, sales manager, Ramset Fastening Div., Cleveland, the biggest producer.

Today's propelling unit costs about $132, looks very much like an old horse pistol. It will fire one of about 100 different types of fasteners into steel up to 1 in. thick, concrete, cinder blocks and other material.

Tough Tests — Underwriters' Laboratories, Inc., Chicago, reports that once set, fasteners are difficult to remove. The testing company fired fasteners into concrete blocks and subjected them to 2000 to 2200 vibrations per minute for 115 hours. It took a pull from 3300 to 5000 lb to unseat the fasteners.

Safety factor has been particularly improved. Latest units will not fire unless properly placed. Shells are .22 cal. instead of the original .45 cal., and are color coded.

New Possibilities—Practically all uses for powder-actuated fasteners so far have been for fastening and anchoring. But industry leaders are looking around. Ramset believes a potential market is for driving out sawed off ends of boiler tubes being replaced. Company is also doing some spade work on the possibilities of shooting fertilizer pellets into the ground.

Big Time Saver — Biggest advantage of powder-actuated fastening is time saving, say manufacturers. But of increasing importance, they continue, is the fact that work is not heavy, and no special skill is required. This, they feel, will boost sales if the construction industry continues to have trouble finding enough skilled labor.

Fasteners themselves are made of C-1060 and C-1062 cold-drawn steel.

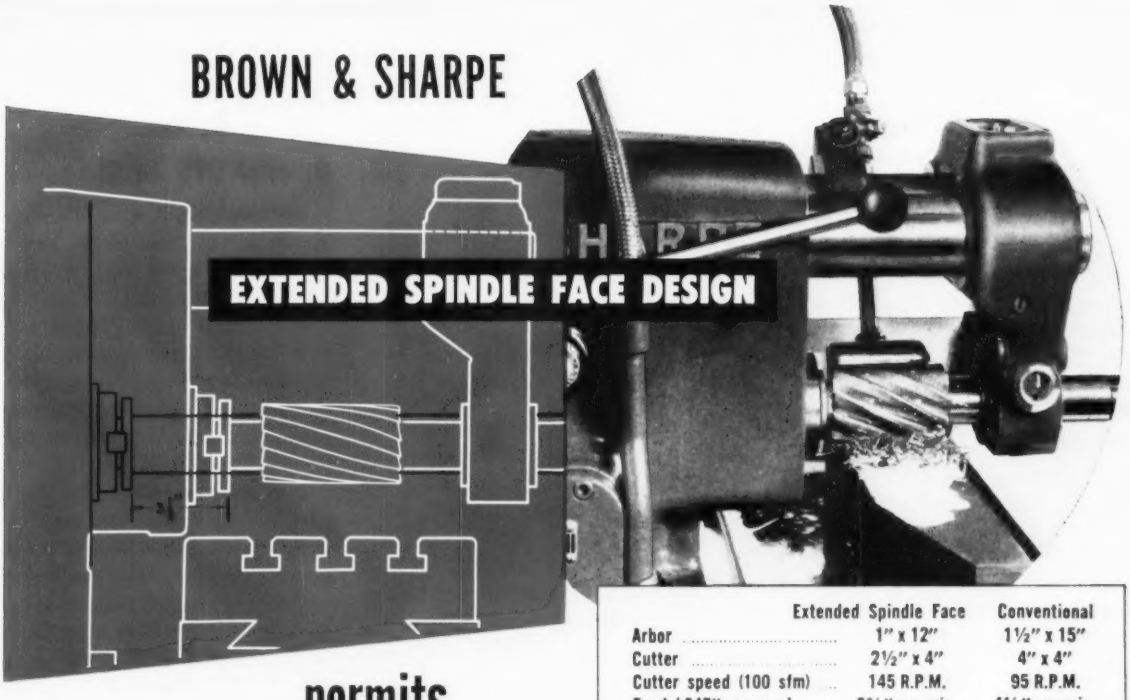
Big Problems—Problems which still need solving are: (1) noise, (2) elimination of free flight of the fastener in the barrel, and (3) development of faster, repeater models. Ramset Fastening Div. says it has made considerable progress suppressing noise. Repeating models are still several years away, say Ramset engineers. First step, they believe, is a unit with a piston hammer to eliminate free flight. This they have done on special models.

Powder-actuated Fastener Industry

Estimated Annual Sales in Millions of Dollars

IRON AGE estimate from industry sources.

BROWN & SHARPE



	Extended Spindle Face	Conventional
Arbor	1" x 12"	1½" x 15"
Cutter	2½" x 4"	4" x 4"
Cutter speed (100 sfm)	145 R.P.M.	95 R.P.M.
Feed (.047" per rev.)	6¾" per min.	4½" per min.

permits

30% SAVING

in cutting tool expense

A simple feature at first glance, the extended spindle face of Brown & Sharpe Universal and Plain Milling Machines is the source of multiple savings in milling costs. As the diagram shows, this exclusive design brings the spindle nose support over 3" closer to the cutting point, providing greatly increased rigidity and resistance to vibration.

PLUS – 50% FASTER PRODUCTION

In the set-up illustrated, the use of smaller diameter cutters permitted an increase in RPM at the given surface speed. Feed rate was increased proportionately, providing 50% faster production with the same surface quality. The extended spindle face is one of many examples of economy-minded design found only in Brown & Sharpe Milling Machines. Get full information . . . compare. You'll find there is no better investment — by any test. Write: Brown & Sharpe Mfg. Co., Providence 1, Rhode Island.

You save with . . .

SMALLER DIAMETER ARBORS

Because of shorter span between supports, a shorter, smaller diameter arbor can be used, with deflection resistance equal to that of 50% larger diameter arbor on conventional machine.

REDUCES ARBOR COSTS

SMALLER DIAMETER CUTTERS

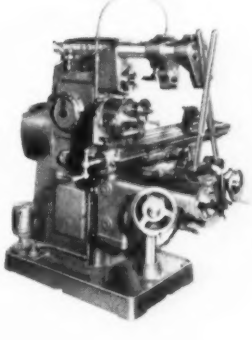
Because of reduced arbor diameter, in the example illustrated a 2½" x 4" cutter with 1" hole replaces the 4" x 4" cutter with 1½" hole required on a conventional machine.

REDUCES CUTTER INVESTMENT

EXTENDED CUTTER LIFE

Extra support and increased rigidity minimizes vibration. Cutters run longer before resharpening. Downtime is reduced.

SAVES MAINTENANCE COSTS



No. 2 UNIVERSAL Milling Machines 3 and 5 HP Spindle Drive

No. 2 PLAIN Milling Machines 3 and 5 HP Spindle Drive

Brown & Sharpe

MILLING, GRINDING, AND SCREW MACHINES, CUTTERS, MACHINE TOOL ACCESSORIES, PRECISION TOOLS, PUMPS

Acme Confirms Plan

Acme Steel Co., Chicago, confirmed earlier reports that plans for its hot metal mill call for an annual capacity of 450,000 tons. This is expected to meet about 70 pct of Acme's unfinished steel requirements.

Acme has been rated since 1954 as the nation's largest producer of cold-rolled strip. It has purchased semi-finished steel from integrated producers for rerolling. The company entered the hot metal production field with its recent acquisition of Newport Steel.

The new hot metal facilities will be located at Riverdale, Ill. The new capacity will consist of cupolas supplying molten iron to oxygen converters of the general type already in operation at McClouth Steel.

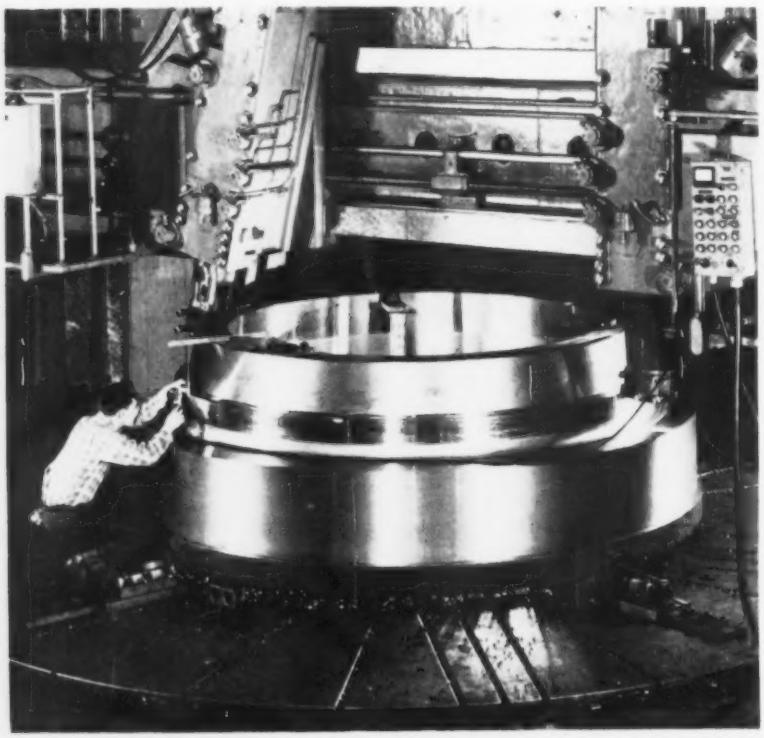
Present plans call for an outlay of $50 million for a five-year expansion program. About $2 million per year will be invested in Acme-Newport, $3 million per year in the existing Riverdale plant, and the remainder for the new hot metal facilities. Construction on the latter will begin in May and will require from 18 months to two years to complete.

New Single Wing

A new wing will be built on the American Smelting and Refining Co. nonferrous laboratory, South Plainfield, N. J. The new unit will add about 20,000 sq ft of lab space, increase of about 33 pct.

Operations are scheduled to begin in the addition by the end of 1957.

Projects will include asbestos application and process research, production and study of high purity metals, research on refractory metals such as rare earths, and on high temperature metals.



BIG FORGINGS: Modernization of U. S. Steel's heat treating and forge division at Homestead Works makes possible larger and more intricate forgings. Here, a 35-ton flange for a nuclear power reactor is checked before it leaves large 20-ft vertical boring mill where it was machined.

National Steel Will Spend $95 Million

National Steel Co., Pittsburgh, figures it will spent about $95 million on expansion and modernization in 1957.

Paramount in the project will be installation of two continuous galvanizing lines and a continuous cleaning and annealing line for tin plate. A new building will be put up for the latter.

Part of Program—The work is part of an overall National Steel program which has been in progress for several years. The company anticipates its completion in 1958.

Going into 1957 National's ingot capacity stood at 6.2 million tons. An 800,000-ton boost during the year will up capacity rating to about seven million tons by early 1958.

Edsel Likes Ohio

The new Edsel Div. of Ford Motor Co. announced that the Cleveland area will be the No. 1 supplier of parts for the new medium-price car.

This will be in addition to the present $75 million annual Ford payroll in greater Cleveland and $300 million annual purchases from outside vendors.

N. K. Van Derzee, Edsel's assistant general sales manager-marketing, said in Cleveland the new car will be introduced in the fall, possibly ahead of other Ford company models. Production will start off at a 200,000 cars per year rate and they are counting on producing a total of 10 million by 1965.

All tooling and set-ups are up to date, Mr. Van Derzee added. Since assembly will be sandwiched in with other company models in most locations, it would appear there will be a conventional body and frame, rather than unitized frame. Van Derzee added the Edsel would be new in style, identifiable from all directions but not radical in departure from other Ford lines.

IN ELECTRICWARE, TOO,

Sharonsteel Quality STANDS OUT

- There are so many advantages to stainless electricware it's no surprise that sales are skyrocketing. Homemakers like the natural beauty of stainless — the way it easily absorbs the punishment of everyday use and stays forever new with a minimum of care.
- Sharon's thorough knowledge of the utensil industry, the ability to produce specification steels of consistent uniformity, plus the finest finishes in the industry are reasons why so many of the nation's leading electricware manufacturers specify **Sharon Quality Stainless Steels.**

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Here's the "Inside Story" on LAMSON Tapping Screws

ADVANTAGES OF LAMSON TAPPING SCREWS

1. Full threads to the head.
2. High stripping strength.
3. Correct points for low driving torque.

The key to the efficiency and holding power of Lamson Tapping Screws is the *controlled fit* between the screw threads and the hole into which they are driven. The enlarged section shows how threads are formed when the right sized screw is used in the correct diameter hole.

LAMSON & SESSIONS will be glad to recommend hole sizes and screw sizes for your requirements. Send for your free brochure on Small Screws for additional information.

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Carl L. Ipsen

How to Revive a Trade Group

To make a cohesive force out of a group of strong competitors is not easy.

What this association needed was someone who knew the industry inside and out.

He had to be a diplomat, a catalyst and an organizer. Their man was among their own ranks.

■ If you had attended a meeting of the old Industrial Furnace Manufacturers Assn. back in 1952 you'd have wondered how long it would live. Members openly asked from the floor just where their dues were going, what the association was doing for them or whether it had plans to do anything at all.

It was at this point that several of them got together to persuade Carl L. (for Laurencious) Ipsen to retire ahead of time from his post as general manager of GE's industrial heating department to become executive vice president of IFMA.

Turning Point—He tackled the job with the vigor of a big (6 ft 2 in., 215 lb) Kansan. He moved association headquarters to Washington, where in 1951 he had headed the Industrial Heating Section of the National Production Authority. Liaison with government agencies improved, member interest soared. Most of the big names in induction and dielectric heating were brought into the association and its name changed to Industrial Heating Equipment Manufacturers Assn.

Public relations improved, too. A series of industrial heating papers are now a regular part of the National Metal Congress program. More than any other man, Carl Ipsen was responsible for a special 70-page furnace section in the Feb. 25, 1954, IRON AGE.

His connections with the IHEA go back many years. In the late 1930's he was the association's president. When he took over the executive vice president's reins in 1952, he knew what the membership needed.

The Pay-Off — A new member told Carl not long ago, "I'm glad you talked me into joining. I've already learned enough about accounting practice to pay my dues for the next 10 years."

Carl Ipsen takes no credit for any of these accomplishments. This may be half true. The other half is that he is a catalytic agent and a smoother-outer of rumpled feelings. A year ago the board voted him a substantial salary increase; he spent 10 minutes explaining why he didn't need it, didn't want it, and shouldn't get it. He got it.

Bad News for Members—Carl will retire next fall. Most members were shocked to hear it—"He's so young!" Few recalled that he'd spent 40 years with General Electric, where he had 22 patents issued. Said Carl, "If you had worked from the time you were 14 until you were 64 wouldn't you think you rated a rest?"

Prediction: He will be back in the industry as a consultant within seven months.

CMP

RESTRICTED SPECIFICATION COLD ROLLED STRIP STEEL

for Spring Steel Requirements such as these . . .

FORMED PARTS FOR HEAT TREATMENT

SIZE	8 x .036
ANALYSIS	1050
FINISH	Bright
HARDNESS	Rockwell B-78 Max.
THICKNESS TOLERANCE	± .0003 incl. crown
WIDTH TOLERANCE	± .005
MICROSTRUCTURE	Uniform spheroids
COIL SIZE	16" I.D. coils large as possible
PACKAGING	On skids — shrouded

FLAT PARTS FOR HIGH STRENGTH WITHOUT HEAT TREATMENT

SIZE	10 x .020
ANALYSIS	1075
FINISH	Bright
HARDNESS	Rockwell C-30 Min.
THICKNESS TOLERANCE	± .001 incl. crown
WIDTH TOLERANCE	± .005
MICROSTRUCTURE	Small-fine carbides
COIL SIZE	16" — I.D. Max. coil wt. 1000#
PACKAGING	On skids — shrouded

Knowing exactly what you require for most efficient fabrication and most effective product performance, CMP can set up and consistently meet restricted specifications to match your most exacting demands. Often production operations can be greatly simplified or even eliminated; in most instances end-product and/or assembly costs can be reduced and quite frequently, product quality improved.

We would welcome an opportunity to explore with you the possibilities of CMP Restricted Specifications applied to your strip steel requirements.

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COLD ROLLED STRIP STEEL

Now there are three CMP plants with facilities for production of "Restricted Specification" cold rolled strip. Strategic locations at Youngstown, Indianapolis and Los Angeles, provide the security of 3 sources of supply plus the close working relationship which these local production centers make possible.

SIZE	14 x .040
ANALYSIS	1095
FINISH	Bright
HARDNESS	95 to 105 Rockwell B suitable for blanking
THICKNESS TOLERANCE	± .0005 incl. crown
WIDTH TOLERANCE	± .005
MICROSTRUCTURE	Uniform medium size spheroids
COIL SIZE	16" — I.D. Max. coil wt. 600#
PACKAGING	On skids — shrouded

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CHICAGO - LOS ANGELES - SAN FRANCISCO

Consumer Holds Key to 1957

Consumers have the money to spend and all the confidence in the world.

But their intentions don't indicate any major buying spree as yet.

■ It's up to the consumer. As it looks now, extent of consumer spending will make the difference between a good year for business—and one of the very best.

It may take a little psychological lift to get it started. But the ability of the general public to go on a major spending spree is there. Consumers have the money and they should have the incentive.

Needs a Push—As it stands, capital spending for new plants and equipment will continue at record levels. Government spending, in spite of all this budget slashing talk, will also increase. Only a slight nudge from the buyers of new cars, appliances, and other consumers' durables is needed to keep up or increase the level of the boom.

Where is the spending incentive coming from? For one thing, savings have increased substantially in the past year.

Conditions Good — Probably at the expense of auto and appliance sales, the consumers to a significant extent concentrated in 1956 on cutting some of their installment debt, or salting a little away in the old savings account.

They are now facing the spring buying season in the best possible situation. They have money in the bank, they are making more money, and, even more important, they expect to be making more before the year is over.

Buying Power Up — Here are some of the statistics on consumer finances and spending plans. They are results of a survey conducted in January and February of this year by the Federal Reserve Board and the University of Michigan.

You are familiar with the general increased output of business and industry in 1956. This is reflected directly on 1957's consumer buying power.

Income Up—About 41 pct of all "spending units" reported total incomes of $5000 or over, compared with 36 pct in 1955. The number of spending units in the $7,500 bracket is up to 17 pct.

. . . But there's a Selling Job

Selling to Do—But at the same time, spending plans are not greatly different from 1956. This may indicate there is some selling to do. About 16 pct intend to buy a car, either used or new. This is the same percentage as a year ago, but there is evidence that they intend to spend more.

Also less optimistic: There is a slight decline from last year in number of persons who intend to purchase homes this year. There is also little change in intent to buy furniture and appliances.

Better Things Coming—A total of 45 pct of nonfarm spending units are making more than a year ago. This is the largest percentage of upgraded incomes since 1953. About 40 pct report they are better off than a year earlier.

Pay special attention to this: Before the year is barely under way, 40 pct expect further pay increases in 1957. This proportion of confident wage earners is larger than either 1955 or 1956, and considerably larger than 1954. They might spend the increase, or save it.

Is Tight Money Pinch Easing?

Banks Look for Business — It's premature to say that tight money is over. But there are indications that it is easing considerably.

If you're going to finance a consumer purchase, such as an automobile, you will find the banks happy to see you. And you won't have to pay 5.5 to 6 pct interest, if you look around.

If you need a business loan, it may not be easy yet, but the bank won't put the freeze on you with quite the same frigidity as a month ago. Mortgage money is tough, but even this may be easing.

Loans Decline — The reason? Commercial, industrial and agricultural loans started to decline late last year. This has eased the pressure and competition for money. The rate of increase in consumer credit has also leveled off. Auto paper, although seasonal factors figure in here, started to level off in August, declined gradually in the winter months. These are a few factors.

The current easing has quieted, for the moment, at least, any trend to tighter credit terms, through Federal Reserve Board restriction or otherwise.

AUTOMOTIVE

Will Wolfson Take Over AMC?

He Owns More Shares Than Anyone Else

PROXY FIGHTER: Louis Wolfson's reputation has auto circles buzzing.

For the time being Wolfson is playing the role of the back seat driver.

But some of his ideas clash with those of George Romney, who is at the wheel.

How long will it be, Detroit is wondering, before he tries climbing into the driver's seat?

■ Is Louis Wolfson going to take over American Motors Corp.? Opinion in Detroit at this time is that the former scrap dealer isn't going to do it if he can help it.

Announcement of the extent of Mr. Wolfson's holdings in AMC created a temporary furor in automotive circles for two reasons. First, because of his reputation as a formidable foe in proxy fights and secondly, because of the bad financial position of American Motors.

Losing Money—It is not news that since the merger of Nash and Hudson in 1954, AMC has been steadily losing money. It is also well known that the automotive end of the business has been the chief cause of the lack of profits.

Even more specifically, production of the Nash and Hudson is thought to be the reason for the continued losses. For the fiscal year ended Sept. 30, 1956, American Motors lost around $19 million not including a tax write off of some $11 million. Losses for the first quarter of the new fiscal year were over $2 million.

Output Falling—Here is an example of how the Nash and Hudson have fared so far this year. For the first 5 months of the new fiscal year, the company produced 511 Hudsons, compared to 2672 for the same period last year. Nash production from October to the end of February was 1274 compared to 5985 for the corresponding period a year ago.

On the other hand, AMC's Kelvinator Div. has continued to make money. Production and sales in 1956 were among the best in the company's history. It's generally conceded that the present condition of the company is the main reason for Mr. Wolfson's interest in it. At the time of the annual meeting last month, Mr. Wolfson owned 240,000 shares of AMC stock. This stock, incidentally, was voted with management in a fight with Sol A. Dann, a Detroit attorney who wanted to remake the company.

Doesn't Want Seat—Since the meeting, Mr. Wolfson has increased his holdings by an additional 110,000 shares and is now the biggest single stockholder in the company. As such, the Florida industrialist says that, although he does not want a seat on the board of directors, he does have some suggestions for putting the company on a profitable basis.

In his present position, Mr. Wolfson's suggestions to George Romney, AMC president, can be quite pointed. Any ideas put forth will deal with eliminating nonprofitable items in the company. This does not mean that automobiles will be entirely dropped. But at some time in the future AMC may concentrate solely on the Rambler and drop the Hudson and Nash lines.

Pruning Needed—Mr. Wolfson also hints at the possibility of some type of future merger when he says that he and Mr. Romney may explore the possibility of bringing some new earning power to the

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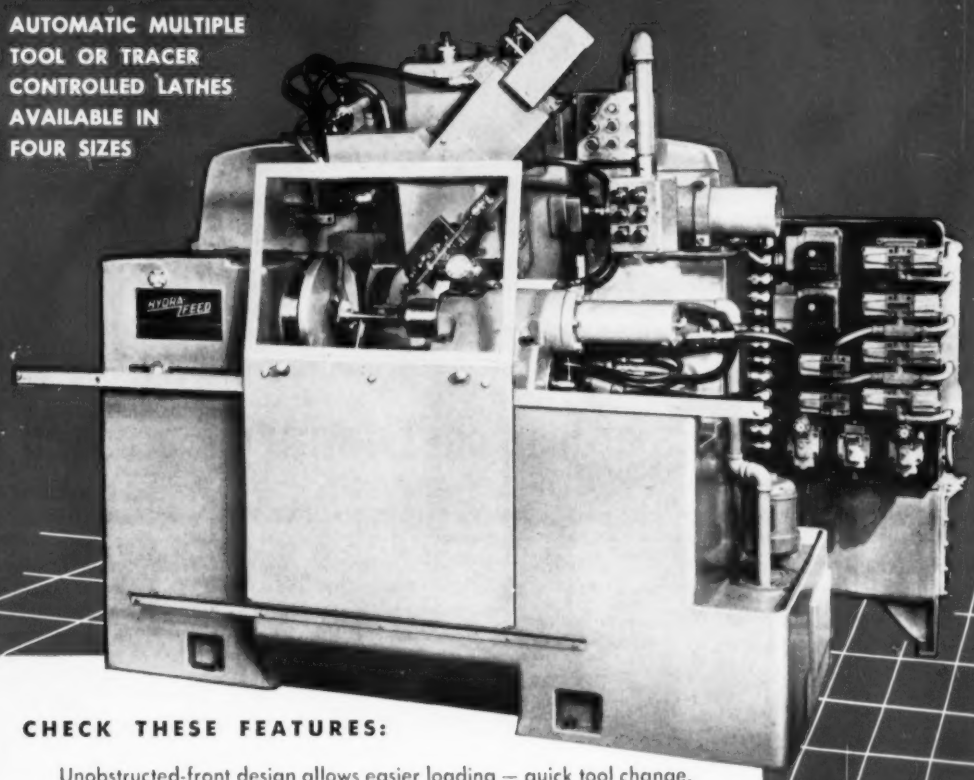

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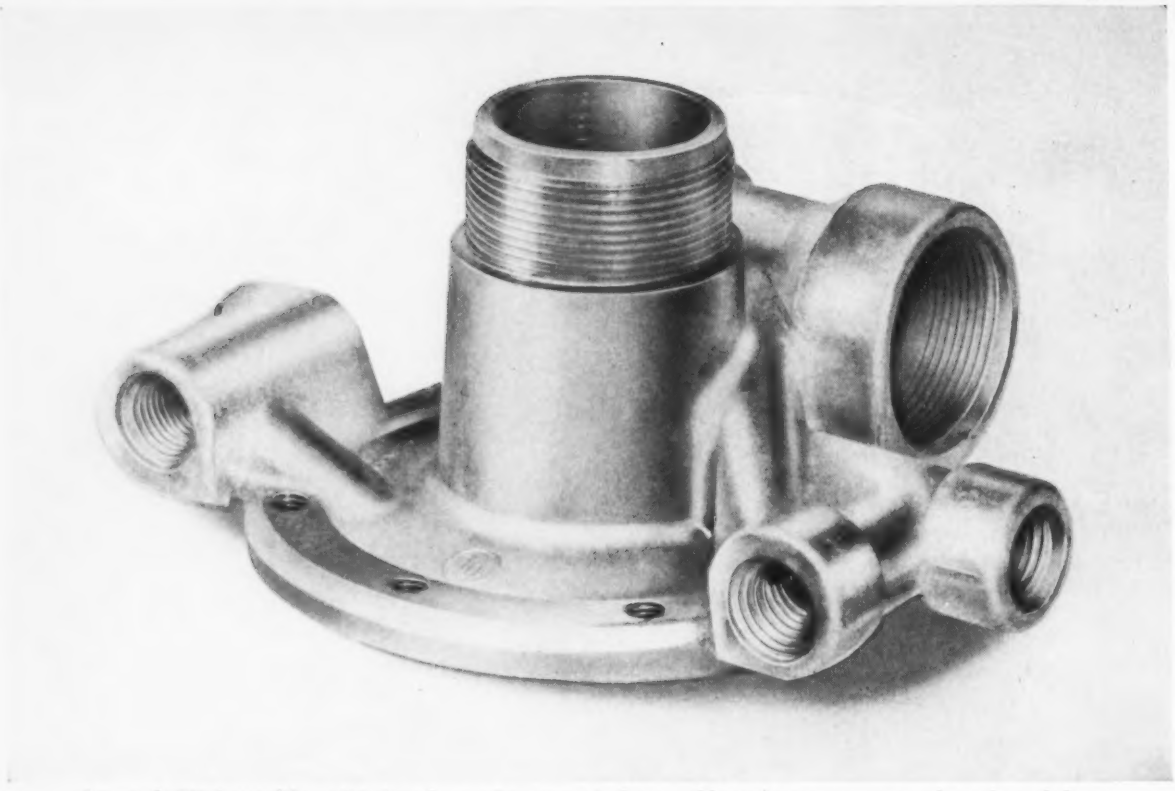
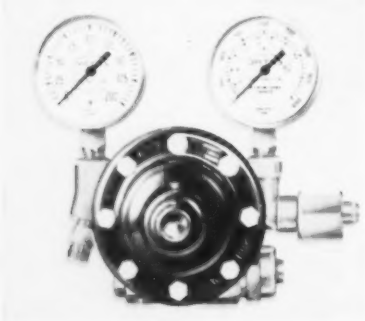


Anaconda Die Pressed Brass Forging after machining, ready for assembly in the gas-pressure regulator shown below.

Better regulators at less cost—with die pressed forgings

Save 25% in first cost—cut machining time, tool cost

Smith Welding Equipment Corp. of Minneapolis uses Anaconda Die Pressed Brass Forgings for gas-pressure regulator bodies as a result of the following analysis of the job.



Smith's two-stage oxygen regulator, Model H513. One of the Smith Welding Equipment Corp. products using Anaconda Die Pressed Brass Forgings.

First, die pressed forgings make a superior product because the twice-wrought metal has the uniformity, denseness, toughness, and strength to prevent gas leaks and to withstand pressures that run in excess of 2500 psi. And second, the forgings do the job economically. The initial cost of the die pressed forging is 25 percent less than the cost of sand castings. In addition, savings are realized in substantially reduced tool costs and machining time. And finally, the forgings are finished in a simple bright-dipping operation, with savings over sand castings estimated at 5 cents a unit.

SHORT CUTS: Anaconda Die Pressed Forgings are short cuts to superior products. Because of their high strength, hardness and resistance to impact, abrasion, and corrosion, they serve better functionally, often replacing more costly built-up assemblies of cast, stamped, drawn, or other machined parts. Their consistent accuracy of dimension eliminates most surface machining to size, permits trouble-free use of drilling jigs, threading or milling fixtures, broaching vises in secondary operations. They are ideally suited to high-speed automatic chucking machines.

The die pressed forging technique is practically unlimited in diversity of shape and field of application. Specialists at The American Brass Company will be glad to submit estimates on the cost of forgings for your critical components. Just submit a sketch or sample of the part involved—or write for Publication B-9. Address: The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Limited, New Toronto, Ontario. 5766

ANACONDA® COPPER ALLOY DIE PRESSED FORGINGS

Short cuts to superior products

Automotive Production

WEEK ENDING	CARS	TRUCKS
March 16, 1957	140,889	22,086
March 9, 1957	140,161	18,835
March 17, 1956	131,207	23,739
March 10, 1956	132,840	24,165
TO DATE 1957	1,523,500	233,000
TO DATE 1956	1,483,200	264,600

*Estimated. Source: *Ward's Reports*

company. The tax write off in such a case would be tremendous. It will be interesting to see what will happen if there is a clash of wills on new company policies.

Mr. Romney says that he is not in favor of dropping AMC's automotive lines, including the Nash and Hudson. The company just recently announced that it will have both a Nash and Hudson station wagon on the market in 1958.

Mr. Wolfson, on the other hand, has given the impression that something is going to be done about the big cars. He says that his suggestions will call for a pruning of nonprofitable operations.

A showdown, if it comes, will be bitter. Right now, everything is sweetness and light and it's possible that it will stay that way.

Congress Looks Into Shady Financing

Car financing methods are run out on the line for a healthful airing on Capitol Hill this week.

A growing volume of complaints has reached the Senate that new car buyers are paying too much for their purchases. In particular, collision insurance rates are being questioned. So are certain no-cash-down plans and "balloon" notes carrying such whopping final payments that refinancing may be needed.

These features of car selling are explored by a Senate Commerce subcommittee on auto marketing practices. Its staff has collected background data from such sources as insurance firms connected with auto finance companies.

Refunds Demanded—Some of the insurers allegedly have taken in excessive amounts for collision coverage. They've done this, it is charged, by deliberately putting buyers into higher cost rate brackets.

Insurance departments in some states have detected the overcharging and demanded that millions of dollars be refunded. The Senate group will examine the progress of the refunds.

No-down-payment plans that are being studied require mortgaging of the buyer's furniture or other property. In addition, the investigators will ask whether certain finance companies use "multiple rate charts" to milk the buyer for all they can.

Small Cars Selling

Automakers in this country are keeping a wary eye on the condition of the small European car market in the United States.

From the standpoint of market penetration, sales of small cars represent a small portion of the total domestic market. But it is significant to note that sales have been steadily increasing in the last few years.

The German Volkswagen is the leader in the field. American Motors Corp., the second runner, has increased its sales of the Metropolitan over 100 pct so far from what it was in 1956. Acceptance has been so good that AMC has set up a separate marketing section for it.

American automakers, although extremely interested, are still not anxious to make a small car. Chances are that they won't be unless the size of the market increases even more.

News for Farmers

Ford Motor's Tractor and Implement Div. has just unveiled an experimental tractor that is powered by a free piston engine. Called the Typhoon, the division says it is the first known installation of a free piston in a farm machine.

Merritt D. Hill, division manager, says the tractor may be the forerunner of a new concept in farm power.

Many of the components of the current internal combustion engine are eliminated. Such things as the crankshaft, camshaft, connecting rods and spark plugs are not required.

THE BULL OF THE WOODS **By J. R. Williams**

THE BULL O' TH' WOODS'S LEGS KINDA GIVE OUT, PADDLIN' AROUND ON THESE HARD FLOORS, AN' HE RUBS 'EM NOW AN' THEN--HE MERELY PUT HIS HAND ON TH' GUY'S SHOULDER TO STEADY HISSELF AN' TH' GUY JUMPS IN AN' MAKES IT LOOK LIKE HE NEEDED A CRANE HOIST!
FUNNY, A GUY'S SMART ENOUGH TO GET TO BE A FOREMAN BUT FATHEADED ENOUGH TO MAKE TH' BIG BOSS LOOK LIKE A DODDERIN' OL' WRECK--HE KNOWS MACHINES BUT NOT PEOPLE!
J.R.WILLIAMS 3-21
THE HELPING HAND
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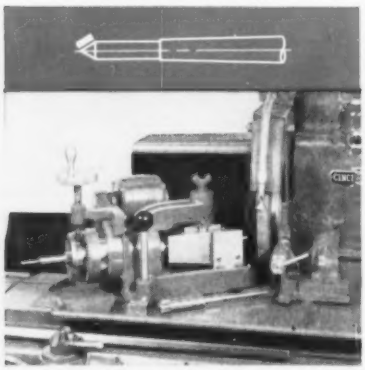
Here's the Point

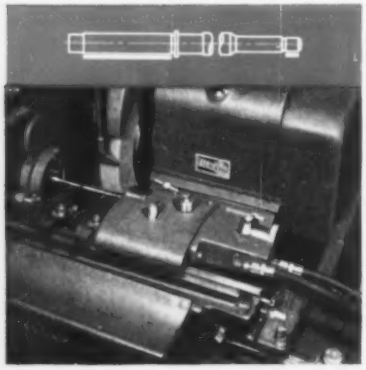
... your standard and special tooling high precision work, from the point on a textile machine part to small armature shafts, get the most economical grind on CINCINNATI® FILMATIC 4" Plain Hydraulic Grinders. May we tell you more? Catalog No. G-551-4 contains complete data; write for a copy.

CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO

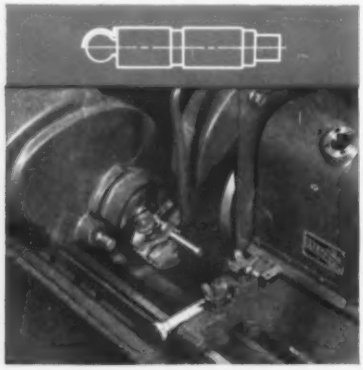
Master roller gages are ground to accuracies of 10 millionths in roundness and size on the CINCINNATI FILMATIC 4" Plain illustrated here. Surface finish within 2 micro-inches. Of course this machine is equipped with a number of extra features to enable it to produce ultra-precision work of this type. Compared to the previous machine and method, tolerances have been cut in half and production is about seven times greater.



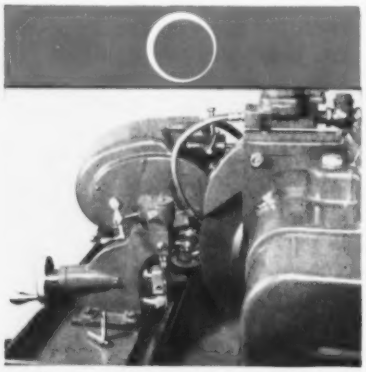
Center angle and point radius are ground concentric with bearing diameters on textile machine parts. This Cincinnati engineered equipment illustrates how simply an unusual production job can be tooled up on a CINCINNATI FILMATIC 4" Plain Hydraulic Grinder. Conventional swivel table, headstock and footstock have been omitted and replaced by a special fixture.



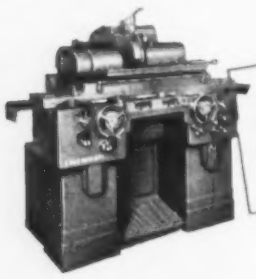
Two diameters are precision ground on armature shafts in two setups, at the rate of 200 per hour per diameter. To reduce operator fatigue while maintaining a high rate of production, the CINCINNATI FILMATIC 4" Plain Hydraulic Grinder for this job is equipped with automatic infeed, hydraulic footstock and work cradles.



Ball end and shoulder are ground in one chucking on a CINCINNATI FILMATIC 4" Plain Hydraulic Grinder. Unique tooling for this job includes combination radius and angular truing attachment, and table with an angular bearing section for live spindle headstock featuring a lever operated draw-in collet attachment.



.048" eccentric diameter ground from the solid. The CINCINNATI FILMATIC 4" Plain Hydraulic Grinder at the left easily handles this heavy stock removal job. Equipment is practically standard with the exception of the work holding fixture and a special table type truing attachment.



CINCINNATI FILMATIC
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GRINDING MACHINE
Catalog No. G-551-4
Brief Specs. in Sweets

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Capitol Is Split on Atom Issue

Cry Goes Up for U.S. to Take Over

Differences of opinion on public vs private nuclear power is to be expected in Congress.

Now there appears to be dissension within the Atomic Energy Commission itself.

How long before the lid blows off depends on the forcefulness of private industry efforts.

▪ Because the cost of developing atomic energy in industry is exceeding the budget sums, some leading Democrats in Congress are demanding that the government reclaim its monopoly over the atom. They claim that industry's high costs in putting the atom to work are "proof" that private enterprise is "unfit" to develop the atom (See P. 64). They want the government to run the U. S. atomic energy industry—lock, stock, and barrel.

Industry is finding the cost of building and operating reactors is higher than had been expected. These higher costs are due chiefly to increasing costs of materials and labor, and to revisions in design and engineering requirements.

Called a Giveaway — The pro-public power lobby in Congress, however, insists that high costs are a sign of "ineptness' on industry's part. This lobby is aided and encouraged by Atomic Energy Commissioner Thomas E. Murray, who makes no secret of his belief that the government, not private enterprise, should own and operate the atomic energy industry.

President Eisenhower's plan for development of atomic energy calls for a partnership deal whereby the government will undertake the research, and private capital will build and operate the reactors. To the Democrats in Congress and to Commissioner Murray this is a "giveaway."

Loan Fund Is Empty

Small Business Administration, after processing a record number of small business loans in the first six months of the fiscal year, now finds itself broke.

SBA officials stopped approving loans on Feb. 1. The agency requested $50 million more. Congress pared this to $45 million. Both houses approved. But the actual appropriation is being held up because it is tied to a hotly controversial, though unrelated, measure providing funds for the mineral purchase program.

Funds still remain for disaster loans handled by the agency.

NEW CHIEF: Wallace E. Carroll, director, Metalworking Equipment Div., BDSA. He is president of American Gage & Machine Co., Chicago.

Good Tax News For Industry?

Internal Revenue Service officials are reviewing the 15-year-old schedule of useful lives of depreciable property. Results of the study could mean important tax savings to business.

The group of IRS officials scanning the depreciation schedules (Bulletin F) is using two consultants from industry. IRS wants more ideas from the business world, and is asking for comments from businessmen and trade associations.

Goal Spelled Out—This review will consider adding new types of property to the list, as well as revising those already included.

Goal of the review is to modernize the often-criticized depreciation schedules by considering changes in operating conditions, technological improvements, and economic conditions.

"Useful Lives" Revival — After new depreciation provisions were enacted by Congress in 1954, IRS practically abandoned Bulletin F in determining useful lives, generally ordering its agents not to disturb depreciation deductions unless there was a "clear and convincing basis for change." The useful lives of Bulletin F are not mandatory, but were designed as a guide.

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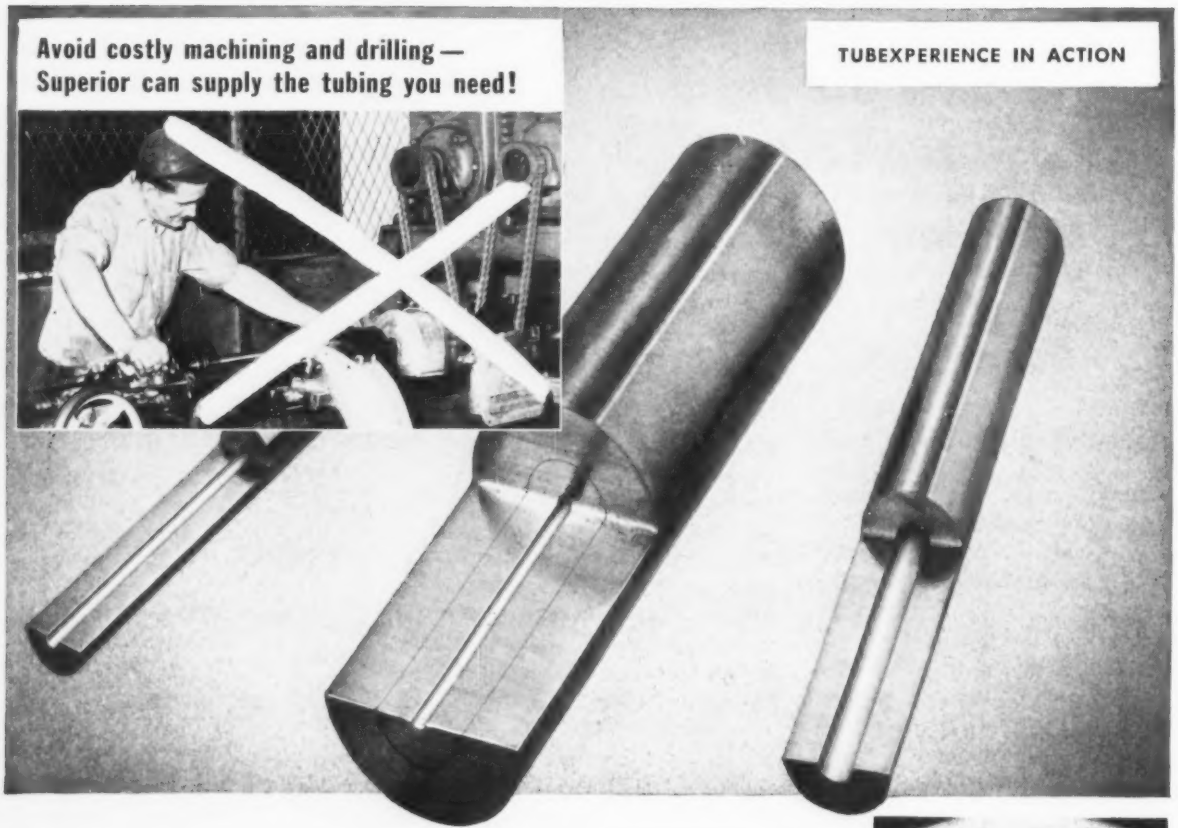

Here's how *you* can take the high cost out of high-pressure installations. No more machining and deep-drilling of stainless steel bar—that's old fashioned and expensive. For high-pressure autoclaves and in research labs where pilot equipment for hydrogenation and polymerization processes require high pressures, Superior super-pressure tubing is cutting high costs, helping avoid critical failures and downtime.

Superior super-pressure tubing offers long service life, high fatigue strength, excellent corrosion and chemical resistance. Available in single wall or composite wall (shown above), it is designed to carry internal pressures ranging from 15,000 to 100,000 psi, in OD sizes ranging from .125 in. to .750 in. Primary advantages of single wall tubing are economy and reliable service, plus long life, at recommended maximum working pressure for a given size. Composite wall tubing, used for extra-high pressures, offers the advantages of combining different materials. For example, the inner wall can be highly corrosion resistant, while the outer wall, not exposed to such corrosion, can be of a more economical material. Analyses for Superior super-pressure tubing include stainless steel Types 304, 316, 321 and 347 and AISI 4130 alloy steel.

Why not call on our long practical experience with super-pressure tubing. We can help you with virtually any tubing problem that confronts you. For more super-pressure tubing information, get your free copy of Data Memo 22. Write Superior Tube Company, 2004, Germantown Avenue, Norristown, Pa.

Unretouched photomicrograph shows etched section of Type 304 stainless steel super-pressure tubing at a magnification of 50x. Note smooth, uniform ID and fine grain structure.

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The big name in small tubing

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All analyses .010" to ⅝" OD—certain analyses in light walls up to 2½" OD

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Retired Brass Back In Harness

Consulting Service Aids Small Firms

Former management men don't fade away in California. They're too busy solving problems.

With their aid a metals firm boosted sales by $50,000, increased profit margins.

They helped a fabricator cut labor costs almost 10 pct. Here's how plan works.—By R. R. Kay.

▪ Got a business problem? Or a bunch of them? If you're an average small businessman you probably have your share. But where can you get expert, experienced advice at a price you can afford to pay?

A San Francisco business consultant believes he has the answer. It's a novel program that's been helping small and medium sized northern California firms for the past six years.

Cost Is Low — The formula: Make available to small companies, at a modest fee, the help and counsel of successful executives now retired. All top men in their field and recently put out to pasture, they're eager to keep a hand in by coming to the aid of businesses in trouble.

Called the Advisory Board Service Plan, the system functions much like a board of directors of a large corporation. Cost of the service depends on the type of business — manufacturing, contracting, or wholesaling. Volume also is a factor.

An initial $100 fee covers a fact-finding analysis after inspection of balance sheets, profit and loss statements, and inventory records going back four years. There's a $50 monthly charge for a company with an annual gross of $100,000. It runs several hundred for a firm doing a few million.

How It Works—Here's how the Advisory Board works: (1) It develops a report form, tailor-made for the client. Each month the company's office manager prepares one of these reports for the Board.

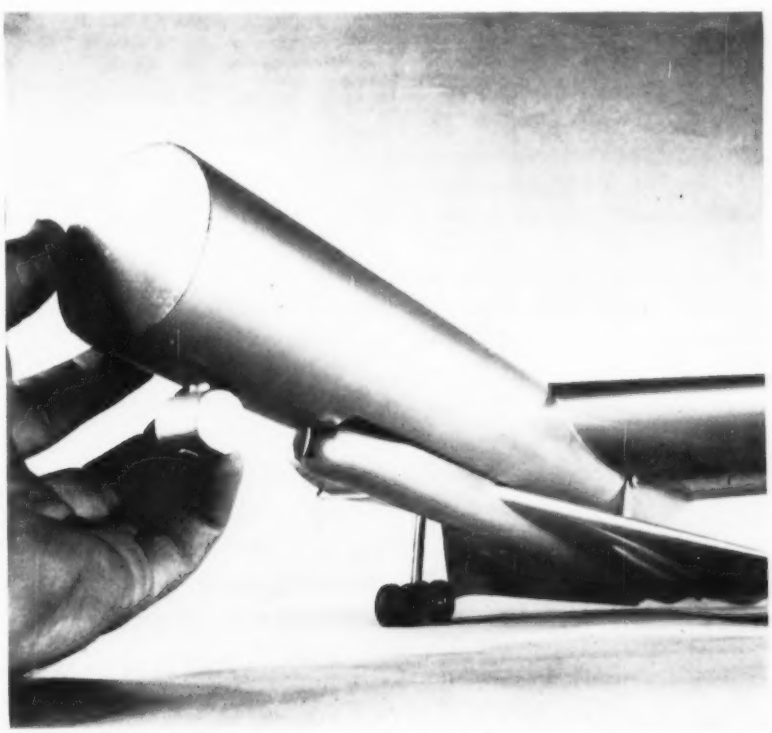
(2) The Board analyzes for progress or for any imbalance that may be showing up. A detailed report of findings plus recommendations are sent to the firm.

(3) The client can consult with the Board at any time—by mail, phone, or in person.

Mr. Logan claims the plan is working out quite well. One metalworking firm with annual sales of $350,000 boosted sales $50,000 in a year after using the service. And its profit margins, normally about 6 pct of sales, climbed to 15 pct. Streamlined sales methods and altered plant layout did the trick.

What It's Done—A steel fabricator, in the million dollar volume class, trimmed labor costs almost 10 pct. This was done by better plant layout and new methods suggested by the Board.

The Advisory Board also helps people who want to set up a new business or buy out an old one.



KANGAROO STYLE: Airframe of the delta-winged B-58 supersonic bomber will be flown to Ohio for further work in belly of a B-36 bomber, as demonstrated in model. Convair engineers in Texas developed the idea.

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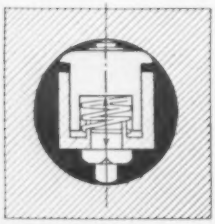
...AND GETS IT WITH FEDERAL DIAL GAGES!



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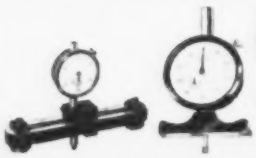

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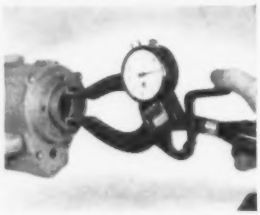

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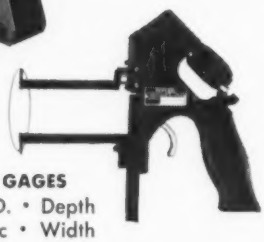

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I.D. • O.D. • Depth
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OVER 12 *TYPES* OF HOLE GAGES — *in all sizes . . .*

If you are not kidding yourself about Precision you know you have to gage a dimension a certain way if you want an accurate measurement.

That's why good gage users know that just *any* gage is *not* good enough. And that is why Federal makes so many different types of gages of the same general kind.

There are all degrees of accuracy required and Federal takes the care to obtain that accuracy.

And some need more gaging pressure, and some less, and some need narrow anvils and some need wide. Some want to gage just a hole diameter and some want to know if it's round or if it tapers.

MANY OTHER TYPES
Send for Catalog. Illustrates the most extensive line available.

It's easy to find the gage you need — get in touch with us. Do it now.

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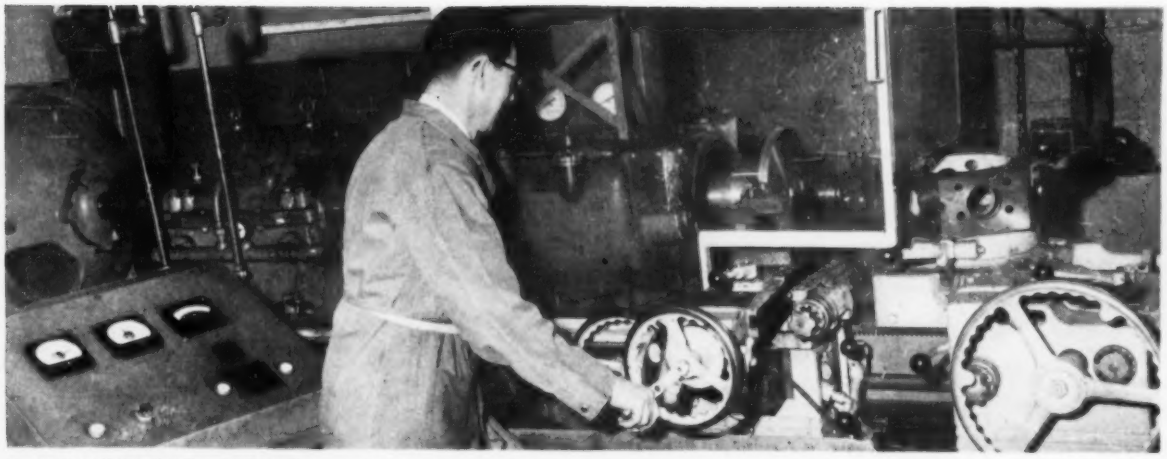
Whatever You Need in Gages —

Ask FEDERAL *First*



CAN YOU BELIEVE IT?: This specially designed turret lathe, equipped with ceramic tooling, has machined steel experimentally at the phenomenal cutting speed of 16,454 sfpm. The workpiece was a 13-in. diam blank of 1040 steel approximately 3½-in. long. Feed was 0.011 ipr with a depth of cut of 0.040 in.

The blank was bolted to the machine spindle and supported still further by a center mounted on the lathe turret. A mechanically clamped holder was used for the ceramic tip. A heavy duty dc motor, coupled directly to the spindle through step-up gears, supplied power.

Although the test demonstrates the high-speed cutting potential of ceramic tools, cutter life in this instance was very short: only one cut per tool edge. The experiment was part of a metal cutting research project conducted for The Warner & Swasey Co. by Ohio State University.

Tool Engineers Invade Houston

Big business and social program lined up for silver anniversary program.

Latest details on Project Vanguard will highlight six-day meeting—By E. J. Egan, Jr.

▪ Don't be surprised at any loud noises you hear coming from the direction of Houston, Tex., between March 23 and 28. It's what you'd expect from the 25th birthday celebration of the vigorous, 36,000-member-strong American Society of Tool Engineers.

There's no big exposition tied in with this year's Silver Anniversary affair. But ASTE officials expect a big turnout at Shamrock-Hilton hotel headquarters for an impressive program lineup.

Big Screen Picture—Highlights of the six-day meeting include technical symposiums on plastic and ceramic tooling, the release of latest detailed information on earth satellite Project Vanguard, and a giant closed circuit telecast of national and chapter officer installations.

In addition there will be award banquets, plant tours, a full fledged rodeo and a barbecue.

Ceramic Tool Bits—The two-day symposium on ceramic tools will cover the latest developments and applications of these tiny bits of material that promise so much to high-speed machining.

The plastic tooling symposium will be another two-day affair. According to advance notice, it will review almost all of the known data on these popular tooling materials.

Builders' Outlook

Annual reports from leading machine tool builders reveal generally excellent business and profit pictures for 1956, and an optimistic attitude toward 1957 prospects. Here are some excerpts from annual presidential messages to stockholders:

F. H. Chapin, president, The National Acme Co., Cleveland: ". . . net earnings in 1956 were the most favorable and dividends the highest of any year in the company's history."

E. C. Bullard, president and general manager, The Bullard Co.: "1956 net income after taxes totaled about $1.5 million, or $2.06 per share. In 1955 there was a net loss of a bit more than $1 million, or $1.41 per share."

INDUSTRIAL BRIEFS

Study in Aluminum—A program to study aluminum aircraft hangars and airport buildings has been launched by Harvey Aluminum Structures, Div. of Harvey Machine Co., Torrance, Calif. The project will formulate new design and stress theories for giant aluminum hangars. It will develop plans for aluminum structures such as airport service buildings, towers, and overseas military installations.

Protective Coloring — Construction has begun for a laboratory building at the Du Pont Company's center for sales service research. It will be operated by the Pigments and Electrochemicals departments. Costing approximately $5 million, the facility will be ready for use by the spring of 1958.

Spring Clearance—General Electric Co. will purchase the Electric Auto-Lite Company's manufacturing plant in nearby Evendale, O. The property consists of two manufacturing buildings. GE has had approximately half of the area under lease from Auto-Lite since 1951 for assembly of aircraft jet engines and processing of spare parts. Negotiations call for GE to take full possession of the property by Dec. 31, 1958.

Battle of the Potomac — Al S. Minetti, vice president and sales manager for Harron, Ricard & McCone Co., San Francisco, is taking a leave of absence to work with the Dept. of Commerce metalworking group, Small Business Administration, as advisor to the director.

Valve Lifters—Rockwell Manufacturing Co. is expanding its program for valve research and development work. The program will be augmented by a new valve laboratory and machine shop at Rockwell's central engineering headquarters at Pittsburgh.

Beating the Drums — A steel drum plant, scheduled for production of new drums about June 1, 1957, is being built in Tacoma, Wash. It will be erected at a cost of $750,000 by the Northern Construction Co. for the Steel Container Corp., a firm recently organized by Arne Strom and Sidney Leven, Tacoma-Seattle industrialists.

Managers' Manager—Irving W. Wilson, president of the Aluminum Company of America will receive this year's Management Award from the Duquesne University student chapter of the Society for Advancement of Management.

Forum for Fabricators — Reinforcing steel fabricators in seven Western states have formed a new trade organization. Known as the Western Reinforcing Steel Fabricators Assn., its membership includes firms of Washington, Oregon, California, Idaho, Nevada, Utah and Arizona. First president of the new association is George L. Cobb of Soule' Steel Co., San Francisco.

Electronic Action—A new scientific group to expedite the development of electronic and related devices has been formed by Westinghouse Research Laboratories. The group begins functioning immediately in what is to be known as the physics project laboratory. It will function on a "project" basis and will be concerned with a broad range of new devices.

Line Forms — Contracts have been awarded to Continental Industrial Engineers, Inc., and Ajax Engineering Co. by Southwire Co., Carrolton, Ga. They are for melting and holding furnaces for continuous production of aluminum rod of electrical conductor grade. The line will consist of two fuel fired furnaces, tilting type, one large fuel fired melting furnace and a 400 kw electric induction furnace.

Not for Burning — American Smelting and Refining Co. is expanding its central nonferrous Metal Research Laboratories at South Plainfield, N. J., by one-third. The plant will be devoted to asbestos application and process research for ASARCO'S subsidiary, Lake Asbestos of Quebec Ltd; to production and study of high purity metals; and for research on refractory metals.

Clean Victory—The 1957 John Woodman Higgins Redesign Award presented annually by the Worcester Pressed Steel Co. was won by Ernest J. Urbas of the Guarantee Specialty Manufacturing Co. The $500 prize was awarded at the spring technical meeting of the Pressed Metal Institute for his re-design of a shower bath head which may save as much as $25,000 a year.

Kudos for Cordiner—The Economic Club of New York presented its first Gold Medal Award for Management to Ralph J. Cordiner, president of General Electric Co. The medal is awarded to "recognize excellence in management and to emphasize the contributions made by the executive and his company to the strength of our nation and to the prosperity of our people."

"I always like to give the handicapped folks jobs. Miss Kent, there, is nearsighted."

Doing Gas-Shielded Welding?

MAGS PROCESS

SAVES 80%

OF SHIELDING GAS COSTS

In the new MAGS process low cost CO_2 (1½¢ or less per cu. ft.) is the only shielding gas used. Savings up to $7.00 per hundred feet of shielding gas over expensive argon or helium.

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Welds are equal or superior to those made with straight argon or helium on all types of carbon steels.

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The MAGS process makes the advantage of shielded gas welding practical for even low budget applications.

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Developed by Liquid Carbonic specifically for metal-arc-gas shielded welding, this extremely pure gas assures MAGS welds of the highest quality. Available in cylinders or bulk systems.

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J&L PRESSURE TUBING

J&L electric resistance welded pressure tubing can easily be fabricated according to your requirements. Fabrication costs are minimized.

Most modern testing procedures assure maximum strength and safety standards. J&L, an integrated steelmaker, controls every step of production from iron ore to finished tubing. The J&L stencil on pressure tubing is our guarantee that every safeguard possible has been used to assure top quality for you.

Specify Jones & Laughlin pressure tubing for quick delivery, long life and maximum strength. For name of your nearest source, write to the Jones & Laughlin Steel Corporation, Dept. 403, 3 Gateway Center, Pittsburgh 30, Pennsylvania

J&L STEEL

Jones & Laughlin

. . . a great name in steel

W. Wilfred Groves, named general manager, manufacturing, Yale Lock and Hardware Div., **The Yale & Towne Manufacturing Co.**

Dr. Glen H. McIntyra, elected president, **Horizons Titanium Corp.**

Edwin E. Proctor, elected president, **Proctor-Comstock Steel Co.,** Sacramento, Calif.

John J. Bachner, elected president, **Chicago Molded Products Corp.**

Harry M. Cook, named manager, industry sales, **Clark Controller Co.,** Cleveland.

Centre W. Holmberg, Jr., elected vice president, sales, **August W. Holmberg & Co., Inc.,** Flushing, N. Y.

Walter F. Rockwell, named chairman, finance committee, **Rockwell Manufacturing Co.,** Pittsburgh.

William I. Kryder and **James V. Lester,** elected vice presidents, **Standard Pressed Steel Co.,** Jenkintown, Pa.; **Charles A. Thomas,** named asst. secretary.

William H. Stapleton, named general manager, purchases, **Inland Steel Co.,** Chicago.

G. L. Stancliff, Jr., appointed vice president and general manager, **Askania Regulator Co.,** Chicago, subsidiary of General Precision Equipment Corp.

Thomas M. Ryan, elected vice president and general manager, **Press Automation Systems, Inc.,** Center Line, Mich.

Edwin J. Faster, named purchasing agent, Indiana Harbor Works, **Inland Steel Co.**

H. C. McDaniel, named director, technical information, **Westinghouse Electric Corp; Robert V. McGahey,** appointed manager, technical publicity.

H. Rush Spedden, appointed director, research, **Union Carbide Ore Co.,** Div. of Union Carbide and Carbon Corp.

C. Jay Parkinson, appointed general counsel, **The Anaconda Co.,** New York.

Charles W. Meyers, named director, Product Planning & Development Div., American Steel & Wire's General Sales Dept., **U. S. Steel Corp.**

George R. Carter, appointed erecting manager, Chicago office, American Bridge Div., **U. S. Steel Corp.**

R. S. Abrams, appointed manager, production and engineering, Silicones Div., **Union Carbide and Carbon Corp.**

H. Pelphrey, named director, engineering research, **Michigan Tool Co.,** Detroit.

Walter A. Locker, elected president and chief operating head, **United Steel Fabricators, Inc.,**

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CONFIDENTIAL

PLANT LOCATION FACTS

on transportation costs

New York State has the most complete network of rail, water, highway and air routes in the world.

At your request we can determine the cost of assembling a given list of raw materials at any one or several locations within New York State. We will prepare cost and schedule data for the distribution of finished products from such locations to principal points of destination throughout the United States. The analysis can include movements by rail, water, highway or air or a combination of these forms of transportation.

Transportation won't be your only problem in deciding on a new plant location. You will want complete facts on labor, markets, water, available sites or buildings, power, fuel and raw materials. And you will want information on these as they apply to the successful operation of a specific plant.

A tailor-made report

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Our booklet, "Industrial Location Services," explains what we can do for you. To get your free copy, write me at the New York State Department of Commerce, Room 665, 112 State Street, Albany 7, New York.

Edward T. Dickinson

EDWARD T. DICKINSON
COMMISSIONER OF COMMERCE

Wooster, O.; **Carl E. Mathis,** named vice president and asst. to the president; **Charles C. Hall,** elected vice president, sales; **Thomas W. Henderson,** elected vice president, engineering; **Joseph S. Keefe,** elected treasurer and asst. secretary.

H. E. Pollard, named chief engineer, Lindberg-Fisher Div., **Lindberg Engineering Co.,** Chicago.

L. S. Moody, appointed manager, new product development laboratory, Chemical Development Dept., **General Electric Co.,** Pittsfield, Mass.

Thomas M. Hogan, appointed asst. district sales manager, New Orleans office, **Jones & Laughlin Steel Corp.**

C. H. Flinn, named manager, Sales Order Dept., **A. M. Byers Co.,** Pittsburgh.

Peter Iaffaldano, appointed field engineer, Cleveland district office, **Norton Co.,** Worcester, Mass.

Earl F. Warner, named production manager, Lincoln Div., **Ford Motor Co.,** Dearborn, Mich.

A. R. Schneller, named sales manager, welding products and accessories, Welding Products Div., **A. O. Smith Corp.**

Robert J. Dubuc, named manufacturing manager, **The Gear Grinding Machine Co.,** Detroit.

Richard N. Miller, named asst. to the president, **Vitro Uranium Co.,** Salt Lake City; **Leslie D. Lash,** appointed senior engineer; **Tony G. Rukavina,** appointed plant engineer; **Issac C. Fox,** named master mechanic.

John B. Owen, named asst. manager, sales, Alloy Steel Div., **Republic Steel Corp.**

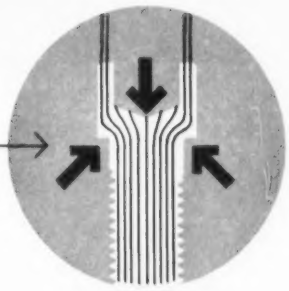
James C. Forbes, Jr., appointed staff assistant, Training Dept., Aliquippa Works, **Jones & Laughlin Steel Corp.**

Ernest S. Infield, named sales manager, Highway Products Sales Div., **United Steel Fabricators, Inc.,** Wooster, O.

John Kempf, named product development manager, adhesives and coatings, **Furane Plastics, Inc.,** Los Angeles, Calif.

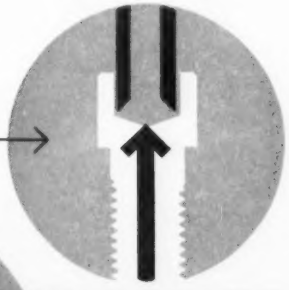
L. M. Thul, named automotive manufacturing trades sales manager, Coated Abrasives Div.,

HOLO-KROME SOCKETS COMPLETELY FORGED!



Metal fibers stay intact for greatest strength. No drilling, cutting, broaching to weaken socket walls.

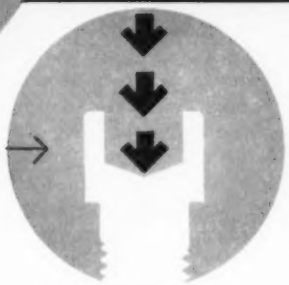
NO WALL TAPER IN HOLO-KROME SOCKETS!



Hex key bears evenly against smooth untapered walls. The results: easier, faster assembly . . . longer key life . . . fewer damaged screws!

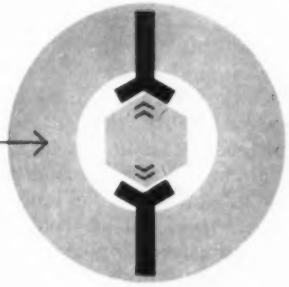
The secret's in the socket of H-K cap and set screws

H-K CONTROLS SOCKET DEPTH FOR TOUGHER SCREWS!



Sockets are formed deep enough for hex key to get a firm, solid bite . . . yet scientifically proportioned to give maximum strength to the screw head.

H-K's SHARP SOCKET CORNERS RESIST REAMING!



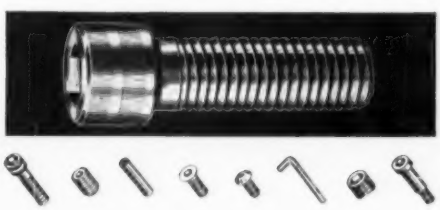
The hex key fits better, bears evenly under pressure, gets a solid grip for positive fastening.

IT TAKES 26 YEARS OF SKILL, EXPERIENCE AND KNOW-HOW TO TURN OUT A HOLO-KROME SOCKET SCREW!

FOR THE FINEST IN SOCKET SCREWS . . . FOR UNMATCHED SAME-DAY SERVICE . . . THE NAME TO REMEMBER IS

HOLO-KROME

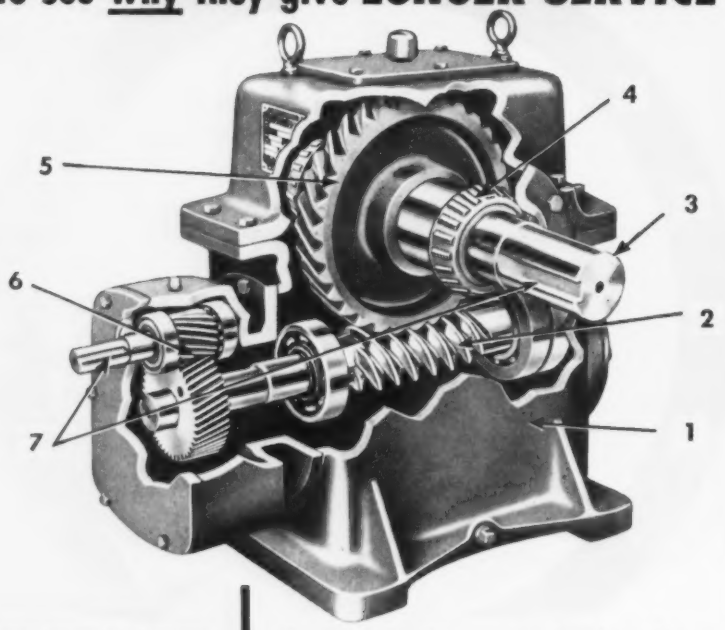
THE HOLO-KROME SCREW CORP., HARTFORD 10, CONN.



Look Inside a Foote Bros.

ENCLOSED WORM GEAR DRIVE

to see why they give LONGER SERVICE



1 EXTRA STRONG CAST HOUSING
Provides rigid mounting and alignment of caps and bearings. Made of high quality cast iron.

2 PRECISION ALLOY STEEL WORM
Integral with oversize shaft. Carefully matched to worm gear for quiet, trouble-free service.

3 OVERSIZE OUTPUT SHAFT

4 HEAVY DUTY, EXTRA LARGE BEARINGS
Oversize bearings used throughout unit. Worm bearings are combination single row radial and angular contact ball bearings. Input shaft bearings are single row radial type.

5 WORM GEAR
Precision generated from uniform density, high hardness virgin bronze alloy casting. High load carrying capacity.

6 HEAT TREATED HELICAL GEARS
Shaved for full tooth contact. Pinion integral with input shaft. Gear locked in position on worm shaft extension.

7 Just one of 10 different types, in a wide range of sizes, ratios and shaft arrangements.

One look at the oversize bearings, larger shafts, precision made gearing and the sturdy housing of a Foote Bros. Hygrade Worm Gear Drive tells you that *this* is a workhorse unit that will stand up and deliver under the toughest conditions.

Notice the carefully balanced design . . . greater mass where it's needed . . . the elimination of weight when it contributes nothing to efficiency . . . strength and toughness at the right places . . . the correct gear alloys . . . the compact design, and above all, the simplicity and ruggedness of this unit.

When you know the *inside* story of Foote Bros. Hygrade Worm Gear Drives, you can understand why they have built a reputation for quality, dependability, and performance that is unmatched by others.

Call in a Foote Bros. Field Engineer. Take advantage of our long experience in this business. Let us help you select or specify the most economical drive for your application.

Write for Engineering Manual HGB. It contains complete information on Hygrade Enclosed Worm Gear Drives.

this trademark stands for the finest industrial gearing made

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Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION

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Minnesota Mining & Manufacturing Co; Donald J. Scholten, named central region sales supervisor; **Ellsworth W. Erickson,** named asst. superintendent, factory quality control.

John J. Miller, appointed general manager, Alumina Div., **Olin Revere Metals Corp.**

Bruce L. Sutton, named sales manager, **Tatnall Measuring Systems Co.,** Phoenixville, Pa.

Stewart E. Davis, appointed general manager, sales, **Excel Steel Co.** and Follansbee Metals headquarters, Pittsburgh.

Wilfred R. Riggs, Jr., appointed manager, Commercial Research Dept., **Kaiser Steel Corp.,** Oakland, Calif.

Robert H. Wasz, named general manager, San Francisco steel service plant, **Joseph T. Ryerson & Son, Inc.**

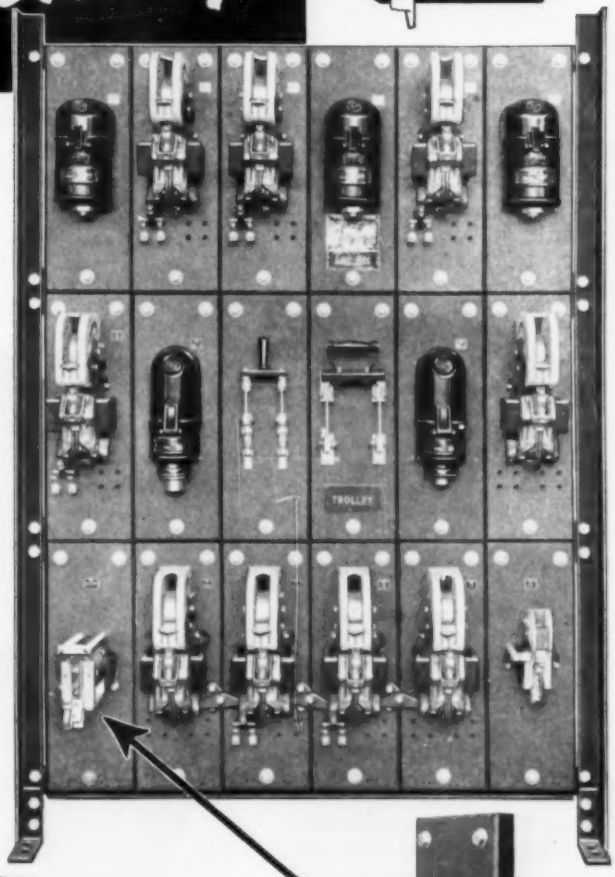
Frederick J. Close, named manager, new residential building products program, **Aluminum Co. of America,** Pittsburgh.

John Matchulat, appointed plant manager, production, **Electro Refractories and Abrasives Corp.,** Buffalo, N. Y.

Charles R. Lewis, named asst. chief engineer and **Hans M. Gadebush,** named special projects engi-

when stopping DC Motors

EC&M's Rectifier Plugging Control System gives FULL PROTECTION!

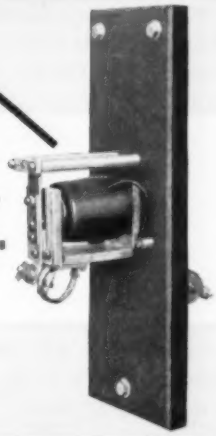


• This is the simplest of all plugging control systems for D.C. mill and crane drives. Only a small rectifier and single-coil mill-duty relay are required. They are connected across the motor armature for operation by counter-emf. The relay allows the plugging contactor to close immediately when starting from rest. When reverse-power plugging is applied to stop the motor, the rectifier permits the relay to pick up and hold open the plugging contactor. As the motor reaches stand-still, the relay drops out to close the plugging contactor and to allow acceleration in the opposite direction.

TWO-STEP PLUGGING CONTROLLERS are available for use on heavy inertia loads such as ore bridge trolleys and ladle crane bridge motions. Ask an EC&M Engineer to explain the improved operation of D.C. motors by Rectifier Plugging.

HERE'S WHY EC&M GIVES MOTOR DRIVES BETTER PROTECTION

- ✔ **POSITIVE RESPONSE** • Relay operates directly from counter-emf of motor.
- ✔ **RELIABLE OPERATION** • Unaffected by line voltage variation. Unaltered if taps on accelerating or plugging resistors are changed.
- ✔ **FULL PROTECTION** • Relay picks up at any speed above 10% of F. L. motor speed. Drop-out occurs as motor reaches standstill.
- ✔ **SIMPLICITY** • Single-coil relay and small rectifier. No electrical interlocks.
- ✔ **LESS MAINTENANCE** • Relay does not require adjustment-maintenance.



View of Type FKP Relay used on EC&M D-C Magnetic Controllers

THE ELECTRIC CONTROLLER & MFG. CO.
A DIVISION OF THE SQUARE D COMPANY
CLEVELAND 28 • OHIO

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neer, GMC Truck and Coach Div., **General Motors Corp.,** Pontiac, Mich.

Paul A. Baxter, named sales representative, **Republic Steel Corp.,** Berger Div. district sales office, Baltimore.

Glenn L. Davis, named chief engineer, **The Deming Co.,** Salem, O; **Eugene T. Brooks,** named asst. chief engineer; **Louis C. Ospeck,** named chief design engineer.

H. E. P. Barta, appointed manager, Project Engineering Sales Div., **The Pfaudler Co.,** Rochester, N. Y.

G. A. Romary, named sales manager, Wagener Pump Div., **Canton Stoker Corp.,** Canton, O.

Marvin C. Bonine, appointed division manager, Pacific Switchgear Div., **Federal Pacific Electric Co.,** San Francisco.

Ralph W. Freeman, named plant manager, plants 1 and 2, Cleveland, **The Iron Fireman Manufacturing Co.,** Cleveland.

Earle D. Stevenson, named sales manager, Sales Dept., **Ackermann Manufacturing Co; J. E. Lally, Jr.,** appointed sales representative.

Hugh D. O'Rourke, named district sales manager, Chicago office, **Research - Cottrell, Inc.,** Bound Brook, N. J.

Revis L. Stephenson, named executive vice president, **The United States Hoffman Machinery Corp.**

Leon H. Fish, named asst. to the president, **Acme Precision Products, Inc.,** Dayton, O.

H. J. Kinkade, appointed manager, Perfex-Pak Div., **Perfex Corp.,** Milwaukee.

J. C. Fosselman, named sales manager, Stoker Div., **Canton Stoker Corp.,** Canton, O.

Joseph B. Gutenkunst, elected president and treasurer, **Milwaukee Tool & Equipment Co.**

Douglas R. Hortvet, appointed chief engineer, **A. O. Smith Corp.,** Texas.

Charles E. Nunes, appointed manager, Reinforcing Products

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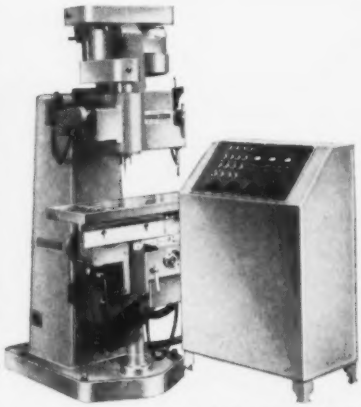
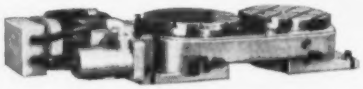
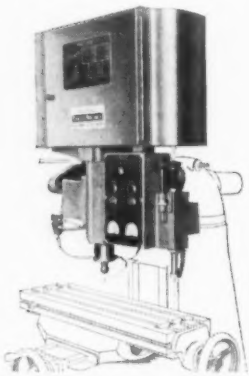
REPRODUCE WITHOUT TOUCHING THE MODEL — WITH PRATT & WHITNEY VELVETRACE EQUIPMENT



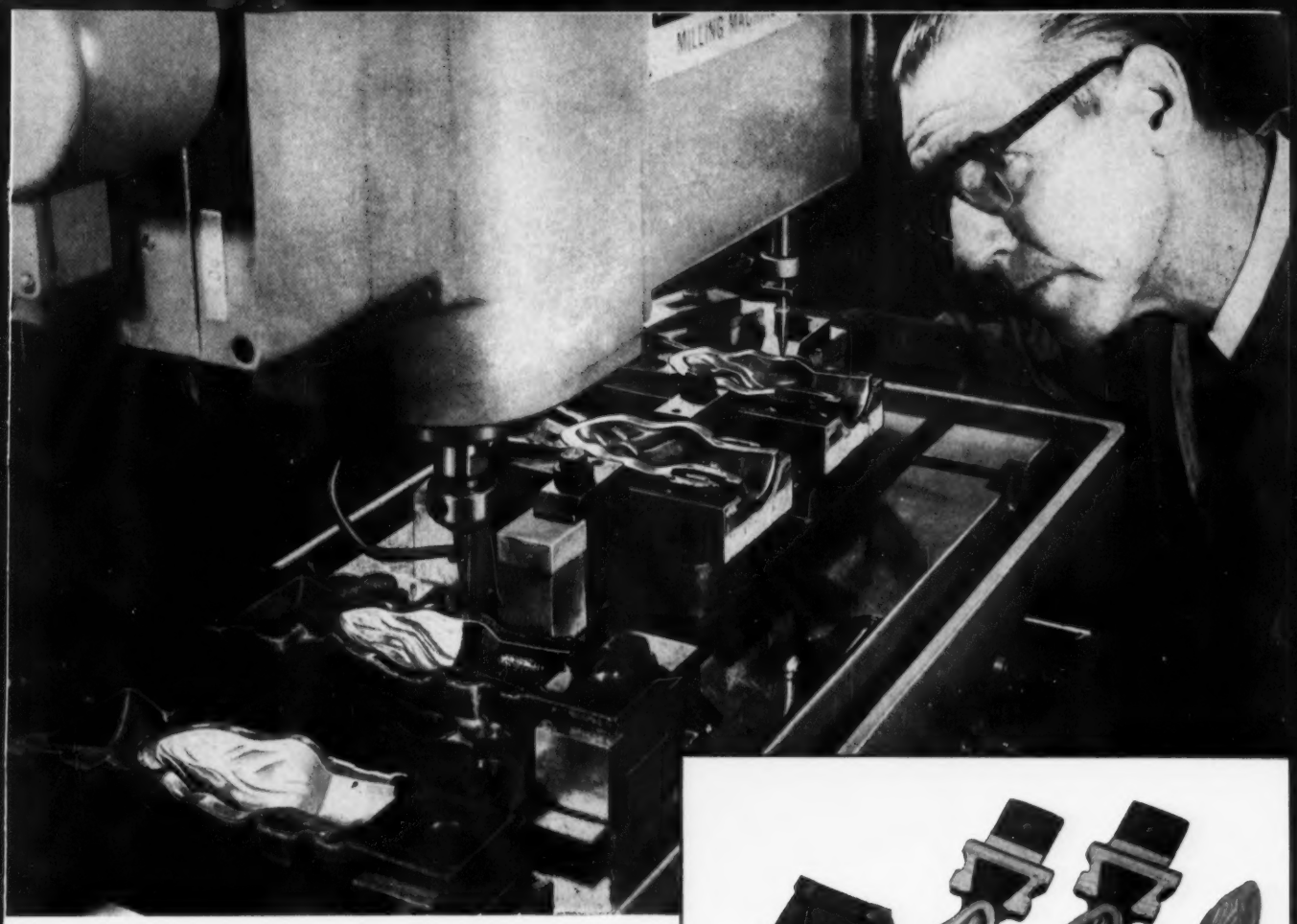
VELVETRACE® MILLING MACHINE . . .
Ultimate in accuracy for 3-dimensional tracer-controlled reproduction. Spindle speeds from 310 to 10,800 rpm. Work size capacity 9" x 12".

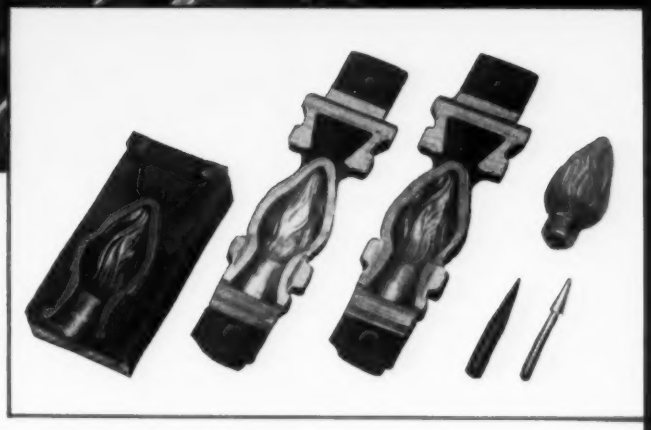


THE VELVETRACE DUPLEX ROTARY FIXTURE . . .
is easily mounted on the table of the Velvetrace Milling Machine. Offers faster setup and machining, and more desirable feed patterns, for milling a variety of linear or circular work.



VELVETRACE MILLING ATTACHMENT . . .
a complete, easily attached unit that brings the outstanding advantages of Velvetrace 3-dimensional tracer control to most conventional milling machines.



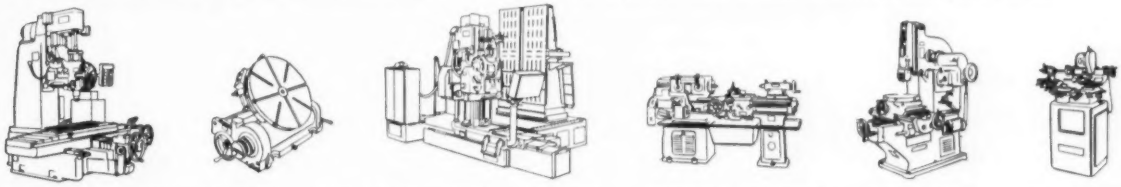


Putting PRECISION REPRODUCTION *in a New Light*

BECAUSE THE PRATT & WHITNEY "VELVETRACE"® MACHINE DUPLICATES THE FINEST DETAIL WITHOUT TOUCHING THE MODEL . . .

These flame-shaped light bulb molds, produced for Corning Glass Works, were machined with such fine detail on the Velvetrace that no hand finishing was required.
Ideal for your die, mold, prototype and other work, the Velvetrace employs a unique *non-contacting* tracer control that follows any 3-dimensional model without touching it . . . cannot damage your model, however soft or fragile, even when using the smallest diameter tracer points. Fully automatic operation with variable speed control to compensate for changes in contour, and a wide range of spindle speeds from 310 to 10,800 rpm insures you fast, economical production.

Write for complete information.
Pratt & Whitney Company, Incorporated,
10 Charter Oak Boulevard, West Hartford. Conn.



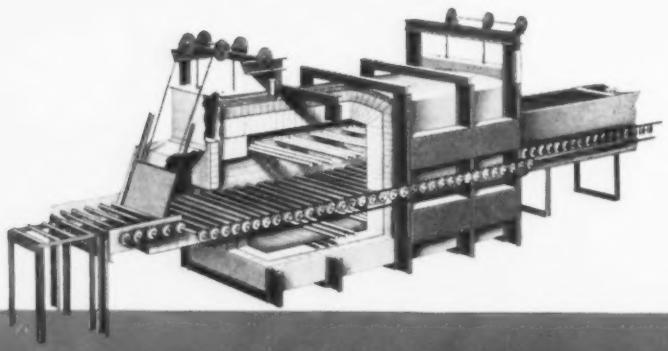
JIG BORERS . . . ROTARY TABLES . . . KELLER MACHINES . . . LATHES . . . VERTICAL SHAPERS . . . CUTTER AND RADIUS GRINDERS

PRATT & WHITNEY

FIRST CHOICE FOR ACCURACY

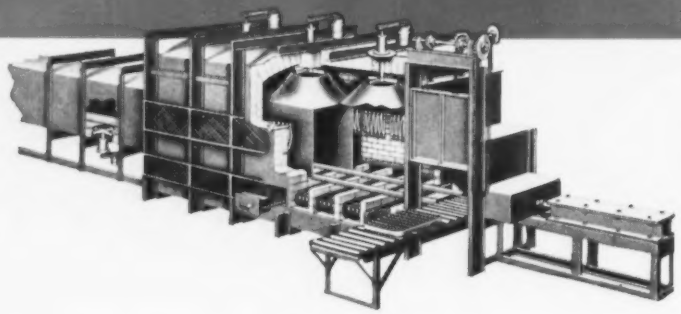
MACHINE TOOLS • GAGES • CUTTING TOOLS

BLAZING THE HEAT TREAT TRAIL WITH HOLCROFT



LET'S TALK ABOUT

the economy of electric heating



Low initial cost—simplified maintenance—efficient use of heat.

All these represent good reasons why electric heat treat furnaces are important considerations. For example, gas-fired and electrically-heated furnaces are frequently competitive; in fact, when total installation cost figures are considered, electric furnaces often have the price advantage.

Upkeep is reasonable, too, because properly designed and installed electric heating elements are so easy to maintain and adjust. Elements are quickly removed for repairs.

Electric heat is more efficiently used for applications in the high temperature range. There is a considerably smaller heat loss in the use of electricity than gas—shrinking the price spread between the two. To be specific, a thorough study must be made of all factors: local power and fuel costs, production demands, quality control standards, etc., before any final decision can be made of the type of heating to be used. Holcroft will help you—a good place to start is to send for our new book **Holcroft and the Electric Furnace.** It's yours without obligation. 5858

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PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

CHICAGO, ILL. • CLEVELAND, OHIO • HARTFORD, CONN. • HOUSTON, TEXAS • LOS ANGELES, CALIF. • PHILA., PA.
CANADA: Walker Metal Products, Ltd., Windsor, Ontario

Dept., San Francisco plant, **Joseph T. Ryerson & Son, Inc.;** Joseph C. **Guptill,** named asst. national product manager.

Josef Reichmayr, named planning and design engineer, **Pennsylvania Engineering Corp.,** New Castle, Pa.

Herbert Rose, appointed chief beneficiation engineer, Freyn Dept., Engineering and Construction Div., **Koppers Co., Inc.,** Pittsburgh.

Malcolm A. Jones, named plant engineer, Fontana Steel plant, **Kaiser Steel Corp.**

OBITUARIES

Reuben J. Russell, 81, vice president and a founder, **Century Electric Co.,** St. Louis.

Meryl H. Geisking, retired asst. to the president, Tennessee Coal & Iron Div., U. S. Steel Corp., Birmingham, Ala.

William Thomas Mitchell, 55, vice president, **Leary-Owens Machinery Co.**

L. E. Ingham, 65, retired vice president, **Texas Gas Transmission Corp.,** Owensboro, Ky.

Ralph J. Clarke, 58, asst. superintendent, Materials Control Div. for Cadillac, **General Motors.**

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Two Fire-Safe Hydraulic Fluids to provide maximum operating efficiency and eliminate danger of Hydraulic Fires

Up to eighty-five percent of all hydraulic applications can operate at top efficiency . . . with complete protection from fire danger . . . with Houghton's Houghto-Safe 620. Houghto-Safe 620 is a water-base fluid which will not burn nor explode. Packings don't have to be changed when you install it. It is non-toxic, safe to handle. It guards against rust and corrosion. Plus benefit: Houghto-Safe 620 costs less than other types of fire-resistant hydraulic fluids.

For systems running consistently above 150°F. and for heavily loaded pumps and bearings, you can get peak hydraulic efficiency with Houghto-Safe 1020. This is a new, specially compounded and fortified synthetic fluid—a further exclusive development of Houghton Research that serves to prevent rust, resist foaming and increase the oiliness factor, thus reducing wear.

Ask your Houghton Man about the two types of Houghto-Safe. He'll be glad to show you how they can take fire danger out of *any* hydraulic job in your plant. E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

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When you need fasteners in a hurry, most of the time you can't afford to wait until somebody makes them for you. With Southern Screw's Stock List at your fingertips, you can know in a moment whether Southern can fill your need from its permanent stock of over One Billion U. S. A.-made fasteners.

For every buyer of fasteners, and especially those buyers who get hurry-up calls, the Southern Stock List will be a welcome addition to your source file.

Write today for your copy of Southern Screw's Stock List and free samples of your current needs. Address Box 1360-IA, Statesville, N. C.

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FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 105.

Fabricating Stainless

A 40-page manual gives information on approved techniques for fabricating stainless steel. (Republic Steel Corp.).

For free copy circle No. 1 on postcard, p. 105

Press Brakes

Heavy duty steel press brakes are pictured in a 4-page bulletin. It describes principal features and gives specifications and capacities of 40 standard sizes. (Dreis & Krump Mfg. Co.)

For free copy circle No. 2 on postcard, p. 105

Screw Machine Work

Manufacturers of stainless steel fasteners are making available a new screw machine products brochure. It depicts typical screw machine work in a variety of tough alloys including stainless steels, Inconel, nickel, and titanium. (Allmetal Screw Products Co., Inc.)

For free copy circle No. 3 on postcard, p. 105

Steel Fatigue

Fatigue properties of cast and comparable wrought steels is discussed in a technical paper. It covers effects of steel composition and heat treatment, surface finish, directionality, and section size upon the fatigue properties of both cast and wrought 1040 carbon steel, four low alloy cast steels (1330, 4135, 8630 and 8640) and four low alloy wrought steels (1340, 4140, 4340 and 8640). In all, 11 heats of cast steel and 8 of wrought steel were studied. (Steel Founders' Society of America.)

For free copy circle No. 4 on postcard, p. 105

Continuous Furnaces

Standard rated continuous heat-treating furnaces are illustrated and described in a 4-page bulletin. It contains specifications, process recommendation and application examples for surface snap hearth, cast alloy link belt and brazing furnaces. (Surface Combustion Corp.)

For free copy circle No. 5 on postcard, p. 105

Stainless Steel

Stainless Steel Type 201 is analyzed in a 4-page technical sheet. This gives detailed information on this chromium, nickel manganese stainless steel. (Allegheny Ludlum Steel Corp.)

For free copy circle No. 6 on postcard, p. 105

Hacksaws

Hacksaw blades and frames are described in an 8-page envelope stuffer. It gives specifications and illustrations on machine and hand blades and also lists material cutting recommendations. (Henry Disston Div., H. K. Porter Co., Inc.)

For free copy circle No. 7 on postcard, p. 105

Engineering Handbook

Can you use advanced technical data on the design, engineering and application of bearings, machine parts, infiltrated parts, plated parts and pole pieces made of powdered

sintered metal? The manufacture and use of powdered metal parts is described in detail in an engineering handbook. (The Bunting Brass and Bronze Co.)

For free copy circle No. 8 on postcard, p. 105

Metallizing

Metallizing powder's use for producing fine crankshaft bearing surfaces is discussed in a new data sheet. (Wall Colmonoy Corp.)

For free copy circle No. 9 on postcard, p. 105

Fluorescent Lighting

Fluorescent lighting is discussed in a 24-page guide. The booklet cites advantages of fluorescent lighting for industrial usage. (Sylvania Electric Products Inc.)

For free copy circle No. 10 on postcard, p. 105

Resistance Welding

"Resistance Welding At Work" is a 16-page publication taken from data of over three years of welding research and actual production welding experience. (Sciaky Bros., Inc.)

For free copy circle No. 11 on postcard, p. 105

Maintenance

To introduce its expanded line of plant maintenance materials, a firm is offering a descriptive folder to plant engineers and maintenance men. It looks into a wide range of maintenance problems. (Chemical Div., Borden Co.)

For free copy circle No. 12 on postcard, p. 105

Shredders

Shredders, grinders and hashers for reducing cork, pulp laps, wood chunks, rubber, etc., appear in a 16-page catalog. (Jeffrey Mfg. Co.)

For free copy circle No. 13 on postcard, p. 105

Grinding Costs

A system of tables and formulas has been developed to predict abrasive belt grinding performance within a 90 pct or better accuracy. They represent a standardization of all known factors (i.e.: abrasive belt characteristics, material grindabil-

PHOTO COURTESY OF ALUMINUM COMPANY OF AMERICA

World's Largest Die

MILLED EASILY, ACCURATELY ON A P&W KELLER MACHINE . . . Consisting of two halves, each weighing 30 tons, this is the world's largest closed die block. Designed to forge aluminum backbones of fuselage and wing structures for the new multi-jet Martin SeaMaster, this giant die was produced by "Kellering" at the U. S. Air Force Heavy Press Plant operated by Aluminum Company of America.

You may not require a 30-ton worksize capacity, but there is a P&W Keller Machine just right for every job requirement . . . ideally suited to handle your dies, molds, prototype work and production milling faster, easier, more profitably.

Write for complete information.
Pratt & Whitney Company, Incorporated,
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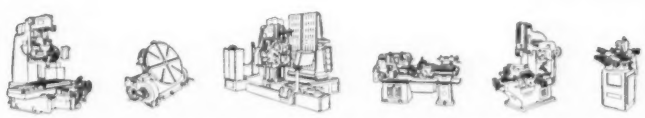

JIG BORERS • ROTARY TABLES • KELLER MACHINES • TOOLROOM LATHES • VERTICAL SHAPERS • CUTTER AND RADIUS GRINDERS

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STRETCH ROLLS THAT STRETCH DOLLARS... for manufacturers of paper-making machinery. They're centrifugally cast by Shenango to provide complete uniformity, pressure-dense grain, freedom from blow holes, sand inclusions and other hidden defects. They'll wear longer, take abnormal stresses, loads and speeds without the risk of costly failure. If you need virtually any symmetrical part, ferrous or non-ferrous, large or small, rough or finished, write to: Centrifugally Cast Products Division, The Shenango Furnace Company, Dover, Ohio.

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COPPER, TIN, LEAD, ZINC BRONZES • ALUMINUM AND MANGANESE BRONZES
MONEL METAL • NI-RESIST • MEEHANITE® METAL • ALLOY IRONS

FREE LITERATURE

ity, lubricants, coolants, contact wheels, dressing action). In an 8 page folder, a manufacturer relates these data to a cost-per-workpiece figure based on least cost per hour at the user's optimum production rate. (The Carborundum Co.)

For free copy circle No. 14 on postcard, p. 105

Press Clutch

Totally new, a fully electric clutch is destined to revolutionize many press operations and bring true automation to the press industry. That's what a company says in its latest reading matter. It describes the clutch in full. (Benchmaster Mfg. Co.)

For free copy circle No. 15 on postcard, p. 105

Welding Bronze

Flux-coated bronze rod for welding bronze and brass and braze welding cast iron and steel is announced in literature now available. (National Cylinder Gas Co.)

For free copy circle No. 16 on postcard, p. 105

Loading Docks

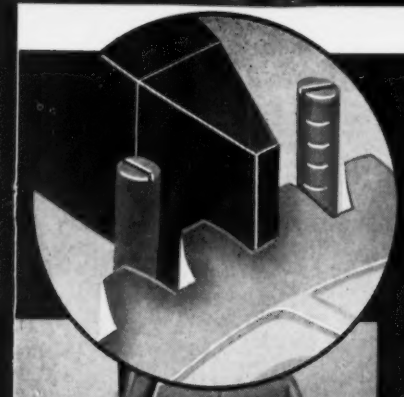
Adjustable powered ramps for loading docks appear in a 6-page brochure. This details various models of a hydraulic leveling device with capacities of 10,000 and 20,000 lb. It may be installed within, or in front of, docks to compensate for variances between carrier and dock heights. (Rowe Methods Inc.)

For free copy circle No. 17 on postcard, p. 105

Rivet Headers

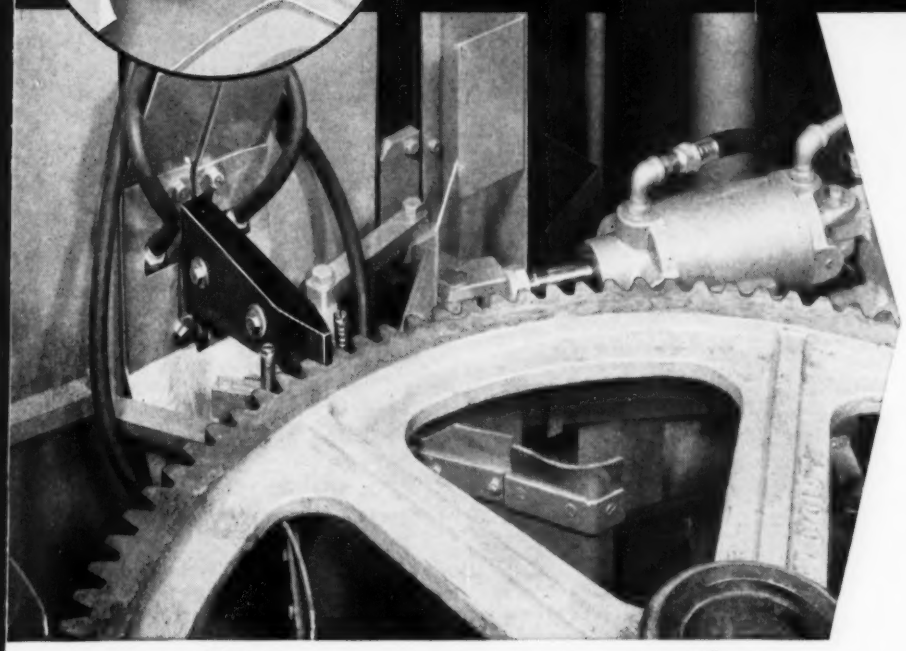
Both 3/16 and 5/16-in. solid-die, double-stroke crank headers for cold heading screw and rivet blanks are extensively covered in a brochure. Described are basic features responsible for the headers' respective production rates of 225 and 175 screw or rivet blanks per minute; maximum lengths, 1½ and 2⅝ in. (Waterbury Farrel Foundry & Machine Co.)

For free copy circle No. 18 on postcard, p. 105



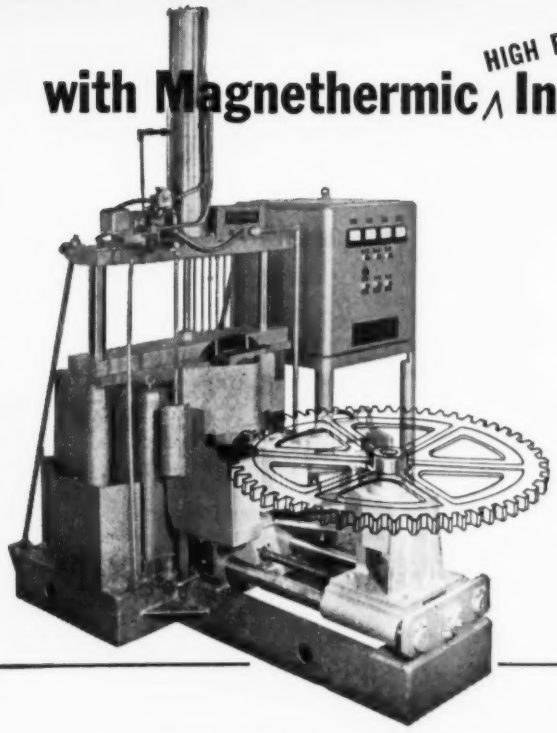
LOOK TO THE ROOT

FOR IMPROVED GEAR PERFORMANCE



tooth by tooth Gear "Hardening"

with Magnethermic HIGH FREQUENCY Induction Scanning Equipment



Heat treating the critical root zone makes an appreciable difference in physical properties and fatigue strength.

With high frequency induction heating, the tooth can be full hard for maximum wear resistance. Large gears can be hardened with small capacity equipment.

Scanning eliminates the need for inductor change with varying gear face widths. Automatic controls, including indexing and quenching, result in a high production rate and uniform results.

This is one type of gear hardening. Size and production rate dictate to a great degree the type of equipment. Whatever your need in gear hardening or other heating applications, Magnethermic's experience with induction heating can be useful.

Prompt response to your inquiry — Magnethermic, Youngstown, Ohio.

see MAGNETHERMIC for Induction Heating

INDUCTION HEATING EQUIPMENT

MAGNETHERMIC corporation

3990 SIMON ROAD YOUNGSTOWN 7, OHIO

(Advertisement)

Special Reports On Finishing Non-Ferrous Metals

NUMBER II—Paint Base, Corrosion-Resistant Finishing with Iridite

WHAT IS IRIDITE®?

Briefly, Iridite is the tradename for a specialized line of chromate conversion finishes. They are generally applied by dip, some by brush or spray, at or near room temperature, with automatic equipment or manual finishing facilities. During application, a chemical reaction occurs that produces a thin (.00002" max.) gel-like, complex chromate film of a non-porous nature on the surface of the metal. This film is an integral part of the metal itself, thus cannot flake, chip or peel. No special equipment, exhaust systems or specially trained personnel are required.

Chromate conversion coatings are well known and accepted throughout industry as an economical means of providing corrosion protection, a good paint base and decorative finishes for non-ferrous metals. However, continued developments have been so rapid and widespread that many manufacturers may not be completely aware of the breadth of application of this type of finish. Hence, this digest of current information; to bring you up to date on the many ways in which you can obtain proper surface preparation for painting and increase product durability with a single multi-purpose chemical pretreatment. Report I on decorative, corrosion-resistant finishes and Report III on chemically polished, corrosion-resistant finishes are available on request.

First, it is an accepted fact that metal surfaces should be prepared before painting to make possible an efficient paint system. Naturally, this preparation should provide for good initial paint adhesion. Chemical treatments have proved extremely effective in this respect, particularly those of a neutral or preferably acid nature. Further, to be most efficient, chemical treatments should provide a non-porous barrier to maintain adhesion by sealing the metal from the paint and moisture. They should also provide a self-healing film which prevents lateral corrosion in the event that bare metal is exposed through scratching.

The Iridite chromate conversion coatings meet all these requirements. Iridite is a chemical conversion treatment for surface preparation. It provides initial paint bonding by molecular adhesion. It is acid in nature and produces a film that is gel-like and non-porous in structure. Thus, the Iridite film effectively seals the metal from the paint and from moisture penetration. Because the film contains certain relatively soluble constituents, it will protect areas scratched through to bare metal and prevent lateral corrosion. This is accomplished by a gradual leaching of these constituents into the damaged area.

Further, because of its gel-like, non-crystalline nature, the Iridite film will not affect the appearance or texture of the paint film, nor will it dust or powder to mar the painted surface. Because the film is non-porous, paint coverage is increased, thus substantial savings in paint costs will be realized. In addition, treated parts may be stored for long periods of time prior to painting without the risk of entrapped moisture causing blistering when painting.

Iridite chromate conversion coatings are widely used with equal ease and success under both baked and air-dried paint systems. While the actual adherence properties of the Iridite film do not increase appreciably with its thickness, corrosion protection does. The protection of the Iridite film is proportionate to its thickness and should be taken into consideration when selecting the Iridite to meet your needs. However, it is sometimes necessary to sacrifice maximum corrosion protection for appearance when a finished part is to be only partially painted. For example, it may be desirable to use a thin, clear, bright Iridite film if the unpainted areas must present a chrome-like appearance. A typical case is that of instrument housings on which the exterior is painted and the inside left unpainted.

On the other hand, if all surfaces of the product are to be painted and maximum corrosion protection is required, the heavier and most protective Iridite films should be used. For example, all surfaces of zinc die cast fruit juicers are finished with a highly protective Iridite film prior to painting to provide maximum resistance to the corrosive action of fruit juices.

Iridite finishes are now available for all commercial forms of the more commonly used non-ferrous metals, including zinc, cadmium, aluminum, magnesium, silver, copper, brass and bronze. In addition to providing an excellent base for paint, the Iridite films also have high decorative value when used as final finishes in themselves.

These films can produce a wide variety of pleasing appearances including clear bright, iridescent yellow, bronze, olive drab and brown. In addition, many films can be modified by bleaching or by dyeing. Among the dye colors available are various shades of red, yellow, green, blue or black.

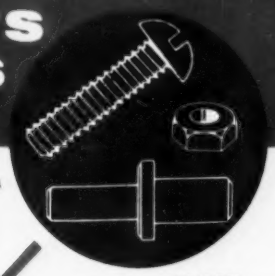
In planning or designing, you should consider the many other characteristics of Iridite finishes which may enter into the specific problem. In addition to their functions as protective and decorative finishes, and as bases for organic finishes and bonding compounds, Iridites have low electrical resistance. Some can be soldered and welded. The film does not affect the dimensional stability of close tolerance parts.

Iridites are widely approved under both Armed Services and industrial specifications because of performance, low cost and savings of materials and equipment.

You can see then, that with the many factors to be considered, selection of the Iridite best suited to your product requires the services of a specialist. That's why Allied maintains a staff of competent Field Engineers—to help you select the Iridite to make your installation most efficient in improving the quality of your product. You'll find your Allied Field Engineer listed under "Plating Supplies" in your classified telephone book. Or, write direct and tell us your problem. Complete literature and data, as well as sample part processing, is available. Allied Research Products, Inc., 4004-06 East Monument Street, Baltimore 5, Maryland.

FOR FAST, EFFICIENT PRODUCTION

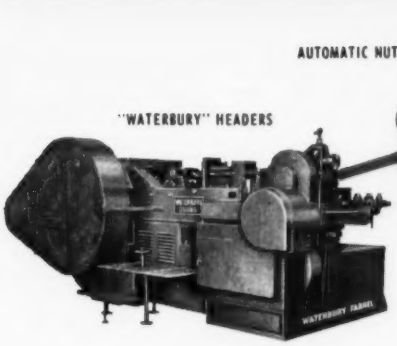
OF BOLTS, NUTS, SCREWS AND COLD FORMED PARTS



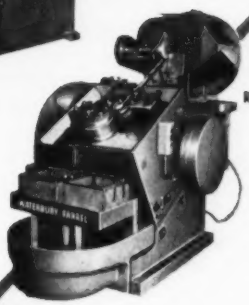
"HEADMASTERS"

AUTOMATIC NUT TAPPERS

"WATERBURY" HEADERS

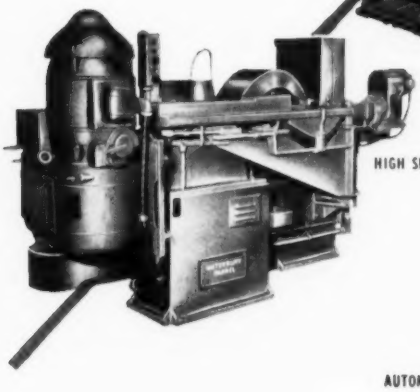


ROTARY THREADERS

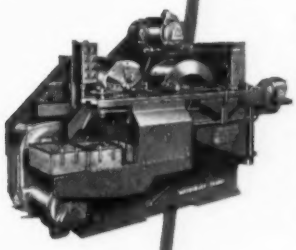


"HI-PRO" HEADERS

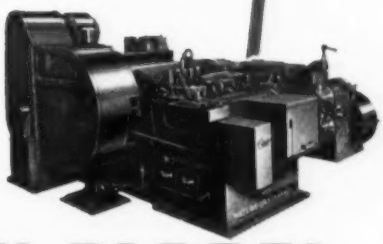
"MODEL 5" SLOTTERS



HIGH SPEED THREADERS



HIGH SPEED SLOTTERS



AUTOMATIC NUT FORMERS

Whether your part is standard or special — needed in mass volume or job lot quantities — Waterbury Farrel engineers can evaluate your requirements and recommend the proper equipment. As builders of the *world's largest selection* of bolt, nut and rivet machinery, Waterbury Farrel can often provide a standard machine, free of special engineering costs, to fit your need.

HEADERS
- Waterbury
- Headmaster
- Hi-Pro
- Progressive
- Toggle
- Tubular Rivet
- S.D.S.S. Crank
- S.D.D.S. Crank
- S.D.T.S. Crank
- O.D.D.S. Crank
- O.D.S.S. Rod
- O.D.D.S. Rod
- Double End Rod

NUT MACHINES
- Nut Formers
- Nut Tappers
- Blanking Presses
- Chamfering Machines

SCREW SLOTTERS
- High Speed
- "Model 5"
- Rotor Vane

THREAD ROLLERS
- High Speed
- Rotary
- Rotor Vane
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- Bolt Trimmers
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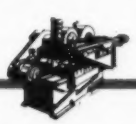
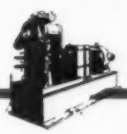
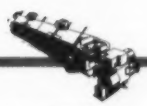


Bolt, Nut & Screw Machinery

Power Presses



Rolling Mill Machinery



Wire Mill Equipment

Sendzimir Mills & Other Special Machinery

WF-30

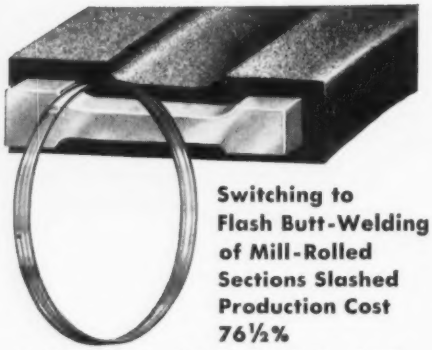
COST

IS A BIGGER WORD THAN EVER

RINGS ROLLED & FLASH-WELDED from a Mill-Rolled Section

SAVED $220.63 EACH

A ring originally designed as a casting weighed 390 lbs. and cost $280.00. Later it was purchased from Amweld, as a rolled and flash-welded ring made from a contoured mill-rolled shape. More than triple savings resulted. Basic cost dropped to $59.37 and weight was reduced to 94.5 lbs. In addition, considerable time and money were saved in the finished machining operation.



Switching to Flash Butt-Welding of Mill-Rolled Sections Slashed Production Cost 76½%

SAVED $103.46 PER RING

Rough rings purchased by a well-known manufacturer of jet aircraft engines weighed 135 lbs. each. Most of this weight was excess metal which had to be machined away. American Welding's Industrial Products Division, working with this company, studied the product and recommended a flash butt-welded ring, formed from a special mill-rolled shape. Adopting this new ring saved 88 lbs. of metal and eliminated much of the machining time required.

American Welding can help cut costs in your plant by suggesting the use of rings rolled and flash welded from mill-rolled or extruded shapes.

THE AMERICAN WELDING & MANUFACTURING CO.
120 Dietz Road • Warren, Ohio

Contact the Industrial Products Division of The American Welding & Manufacturing Company. We will be glad to show you more actual cases of cost savings.

AMERICAN WELDING
The World's Leading Manufacturer of Welded Rings

FREE LITERATURE

This section starts on Page 98

Gloves

How to select gloves best fitted for a particular job at the lowest cost per hour of glove life is told in a 4-page folder. An accompanying 12-page booklet shows how the analysis of glove use has cut costs in typical industries. (Jomac, Inc.)

For free copy circle No. 19 on postcard

Cutoff Saw

A simplified cutoff saw combining precision with economy is announced in new literature. It describes the saw as simple to operate, quickly set-up. (Kenco Mfg. Co.)

For free copy circle No. 20 on postcard

Wire Rope

Photographs and drawings help a brochure to list proper wire rope specification for all types of construction equipment. (Macwhyte Co.)

For free copy circle No. 21 on postcard

Pipe Crimper

Illustrated supplements present a compound leverage pipe crimper. This tool multiplies hand pressure to provide crimping power for reducing the diameter of sheet metal pipe. (Niagara Machine & Tool Works.)

For free copy circle No. 22 on postcard

Metal Lath

"Specifications for Metal Lathing and Furring" is a 20-page booklet. It covers all phases of metal lath construction. (Metal Lath Manufacturers Assn.)

For free copy circle No. 23 on postcard

Glass-lined Stacks

Glass protected steel smokestacks are presented in an 8-page bulletin. It describes how these stacks provide long life and low costs. (A. O. Smith Corp.)

For free copy circle No. 24 on postcard

Ramming Mixes

A 50-page handbook tells how to install a firm's periclase brick and ramming mixes in electric furnaces. It is a well-written, well-illustrated manual containing many suggestions for furnace lining repairs. (Kaiser Chemicals Div.)

For free copy circle No. 25 on postcard

Barrel Finishing

Precision barrel finishing at high production rates are discussed in a 4-page folder. It illustrates several "all-in-one" barrel finishing units. (Speed-D-Burr Corp.)

For free copy circle No. 26 on postcard

Atmosphere Control

Built-in atmosphere controls for heat-treat furnaces are covered in a data sheet. It tells how an atmosphere manometer regulates the air-gas mixture inside one company's furnaces. (C. I. Hayes, Inc.)

For free copy circle No. 27 on postcard

Formed Tubes

"When you want a job done, give it to a busy man." This philosophical thought introduces a firm's 16-page brochure. The literature goes on to tell how this company has the facilities for making formed tubes. (Formed Tubes, Inc.)

For free copy circle No. 28 on postcard

Shape Cutter

Advantages and applications of a portable shape cutting machine are described in an 8-page catalog. Cutting range, weights, dimensions and other specifications are shown. (Air Reduction Co., Inc.)

For free copy circle No. 29 on postcard

Hydraulic Descaling

Hydraulic descaling equipment is described in a 36-page catalog. This pictures the operating principles and features of the new descaler equipment for removal of scale from bars, slugs, and rolled mill products prior to hot working. (Commercial Shearing & Stamping Co.)

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FREE LITERATURE

Float Valves

A 16-page bulletin explains features of cushioned float valves. These maintain accurate water level control in elevated tanks, reservoirs, coagulating basins, mixing chambers, etc. (Golden-Anderson Valve Specialty Co.)

For free copy circle No. 31 on postcard

Vacuum System

A data sheet covers a vacuum system for coating various materials with vaporized metals. This unit is also useful for degassing liquids, crystal pulling and growing, melting metal samples, and degassing vacuum tube electrodes. (Consolidated Electrodynamics Corp.)

For free copy circle No. 32 on postcard

Speed Reducers

Shaft-mounted speed reducers for screw conveyor application are covered in an 8 page publication. The catalog makes selection of drives for screw conveyors a simple matter. By following directions outlined and using the tables, a complete drive can be designed in a matter of minutes. (The American Pulley Co.)

For free copy circle No. 33 on postcard

Heaters

Heaters and heating devices are listed in a 72-page publication. It includes information on such new products as redesigned cartridge heaters, miniature soldering irons, aluminized steel sheath strip heaters,and new ratings and configurations of finned tubular heaters. Also described are the new ceramic-to-metal and plastic resin hermetic seals. (General Electric Co.)

For free copy circle No. 34 on postcard

Fork Truck

Of 3000-lb capacity, an electric-powered, low-headroom fork truck is illustrated in a new 4-page folder. (Elwell-Parker Electric Co.)

For free copy circle No. 35 on postcard

Lathes

Lathes, equipped with 32 preselective spindle speeds in geometric progression, are presented in an 8-page foldout brochure. The publication lists specifications. These machine tools have a bed-swing of between 25¾ and 30¼ in. (The Sidney Machine Tool Co.)

For free copy circle No. 36 on postcard

Conveyors

Gravity and power belt conveyors in various industrial operations are shown in a 4-page folder. It pictures gravity power belt conveyors used in receiving, work in process, warehousing, shipping, packaging, order selection, and other areas. (Rapids-Standard Co., Inc.)

For free copy circle No. 37 on postcard

Ceramics

In its 16 pages, a bulletin covers: high density and standard porcelain mill linings; lifter bars; special mill lining shapes; mill head assemblies; high density and standard porcelain grinding balls; metal covered and ceramic laboratory jars for cradle or roller type laboratory mills. (McDaniel Refractory Porcelain Co.)

For free copy circle No. 38 on postcard

Abrasive Grain

Friable aluminum oxide abrasive grain used in the manufacture of new Borolon grinding wheels is described in a catalog. (Simonds Abrasive Co.)

For free copy circle No. 39 on postcard

Induction Furnaces

Fascinating story of development of high frequency induction heating. Starts with Dr. E. N. Northrup's demonstration at Princeton, tells how he convinced GE's Steinmetz to test his theories. This brought forth the motor-generator set, opened the field for industrial use. Well illustrated, booklet also outlines induction furnace uses in precision casting, vacuum melting, etc. (Ajax Electrothermic Corp.)

For free copy circle No. 40 on postcard

The man with the diamond

The bouncing diamond-pointed weight of the Shore Scleroscope shows its skilled operator whether the hardness of this mill roll's surface meets the specifications of its purchaser. Failure to pass this test is rare at Mack-Hemp: our long experience in roll making . . . one hundred and thirty-four years of it . . . has made the close control of every production step second nature to us, from pattern making to final testing. It is one of the many reasons why *you get more tonnage from the rolls with the Striped Red Wabblers.*

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Division of E. W. BLISS Company
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MACKINTOSH HEMPHILL DIVISION PITTSBURGH U.S.A.

BLISS

ROTOR SHAFT STEEL

For the Unseen Heart of a High Speed Turbine

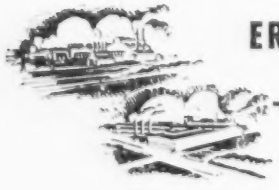
In the heart of a turbine is a huge, single piece, forged rotor shaft.

It takes a combination of skillful, reliable men, and the finest equipment to produce the superior quality, strength and soundness required by these large, fast-rotating forgings. The Erie Forge & Steel Corporation's Research and Development program has the responsibility from selection of raw materials, through melting, forging, heat treating, machining and testing to make quality ingots and forgings that easily meet the greater technical perfection imposed by the Electrical Industry.

This 90" diameter ingot, of high alloy steel, weighs approximately 230,000 pounds. It will be forged on this giant forging press to produce a finished machined turbine rotor shaft, weighing approximately 70,000 pounds.

Here is evidence of the capabilities offered you at Erie Forge & Steel Corporation.

Place your requirements with us, fully confident of the desired results.



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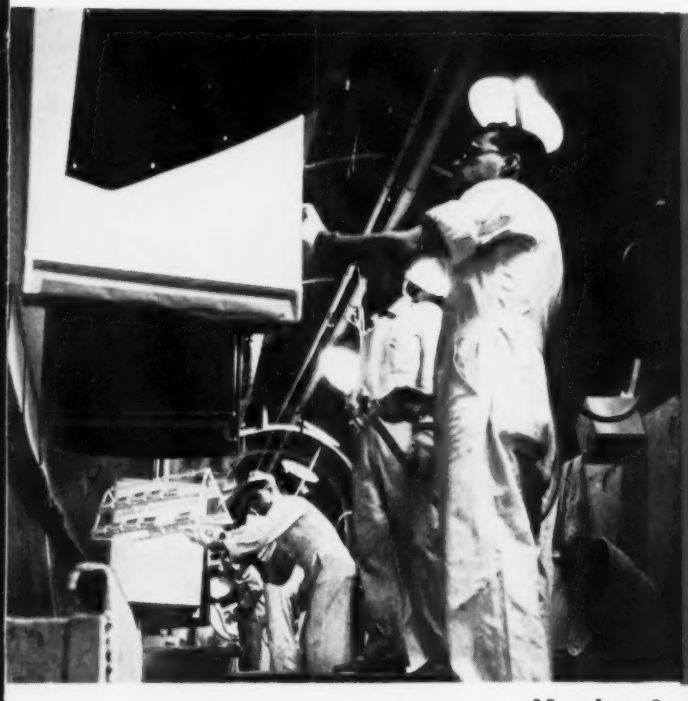


How To Get More For Your Metalworking Dollar

Number 8 of a series

Organic Finishing

IN THIS FEATURE

Today's organic finishing materials are engineered finishes in the true sense. This is partly so of necessity; partly by a trend toward better performance.

There are excellent reasons for this concept. Few raw materials undergo such drastic changes physically as do organic finishing materials. Few are influenced by such an infinite number of variables — in manufacture as well as application.

For these and other reasons, each new finishing job carries with it a new challenge. Virtually every organic finishing material must be "engineered" to give top performance for a specific end use.

Part of the responsibility for getting a durable finish lies with the manufacturer—the rest with the user. Controls must be exercised from beginning to end. Only then can you expect to get all of its qualities.

HOW TO GET MORE FOR YOUR ORGANIC FINISHING DOLLAR

SECTION 1

Good Finishes Begin with a System

Organic finishing materials are better than ever. So is the equipment for applying them.

But there is no such thing as a "universal" finishing material. An "engineered" finish is the result of compromise.

Raw material and process must complement each other to get the best qualities into the finish.

Check on Quality: Chemist at U. S. Testing Co., Inc. keeps tabs on physical as well as chemical properties of organic finishes.

▪ "Almost indestructible."

"One coat gives you 100 pct protection. Two coats give you ten times the protection."

You've seen these claims in paint advertisements or heard such words roll off a glib salesman's tongue. They're exaggerated claims, of course. But it so happens that some of this sales talk is making its mark on the more gullible paint purchasers.

Fortunately, most users of industrial finishing materials, whether intended for products or maintenance, aren't taken in by such bait. To them, buying finishing materials is as big a job as it is important. Along with it, they are buying a finishing system, material performance and service.

Failure to purchase the whole finishing package can be mighty costly—sometimes disastrous. One metal fabricator found it out the hard way, and in time to recover. His new setup was to be among the best. The equipment for metal preparation and spraying was modern. He couldn't find a more efficient quick-bake oven. In fact, after spending a small fortune, he had every right to expect the best results.

It was now time for production, but things didn't go just right. Rejects started to run as high as 50 pct. Cratering in the finish didn't do justice to the quality product.

Calls For Help — Could it be caused by improper or faulty operation of the equipment? Or was the paint at fault? It could have been due to any one or more of a dozen different things. But he couldn't put his finger on them. In desperation, he turned to a paint manufacturer for technical help.

The first shock came with the suggestion that he use a different paint costing $3.35 per gal. He previously paid $2.70 per gal. This he thought, would raise his costs. But he soon realized that a reject rate of 50 pct with the $2.70 paint was no bargain. At $3.35 per gal, he could now buy the performance and service he so sorely needed.

Service Pays Off—The first trial run showed that a silicone lubricant

from parts stamped outside was contaminating all parts in the precleaning treatment. This caused the cratering. Dirty spray equipment threw paint in slugs. Lack of controls invited every passerby to change fluid pressure to his own liking. Two hand sprayers, using too much pressure, applied an excess of paint with wide spray patterns.

Improper and wide grouping on the conveyors also accounted for some rejects. A louver at the oven touched freshly painted parts, causing more rejects. Sanding of rejects in the finishing room resulted in still more rejects.

At $3.35 per gal, he is now satisfied with his painting costs. And he should be because the next three-month period saved him $30,000. The moral of the story is that you don't buy paint alone. You buy a painting system tailored to fit your needs.

The value of the products you make runs into some big figures. The same applies to the structures you want to protect. There's satisfaction for both you and the customer in getting good appearance, then being able to retain it.

Your Criterion — As a manufacturer, there's more to consider than saleability of your product and customer goodwill. These requirements must be coupled with a maximum return on each dollar you spend for painting. Your criterion is the price you pay for each square foot of **approved** product finish.

The same rule can be applied equally well to maintenance painting. In addition to the actual cost of painting, you must consider the kind of service obtained from the finish, length of painting cycle, etc. Briefly, it's the cost per year for **adequate** performance.

Tough Job — With about 1400 paint manufacturers listed — and many scores unlisted—which of these is to get your business? They range all over the lot in experience and knowledge. Their ability to deliver and their reputations vary likewise. So do their product claims.

Wherever you choose to begin, keep one thing in mind. Most of your painting dollar is bound to go out on labor. That applies no matter how careful you are about selecting a quality paint. So it pays to watch those factors which you can control.

Four Points—To get good protection and appearance for a long time at low cost, here are the important things to watch: (1) prepare the surface properly, (2) apply the finish under proper conditions, (3) Control film thickness and (4) get good finishing materials. Remember that the paint itself is only the raw material with which you begin to achieve a satisfactory dry paint film.

As to surface preparation, the best paint and painting practice will do the job almost in direct proportion to the degree of preparation you give the surface. Apply paint to a wet or dirty surface and your costs are sure to mount. Keep the shop well heated and well ventilated, and avoid painting in a dust-laden atmosphere. For your own protection, prevent paint particles from contaminating the air.

SOME POINTERS FOR BETTER PAINTING

Check Surface Preparation Practice. Study Each Step in Application. Be Sure That Conditions of Application Are Right. Use Suitable Primers. Apply Adequate Film Thickness. Evaluate Paints in Lab Tests. Make Panel Exposures. Run Simultaneous Field Tests. Select Paints and Systems to Work as Team. Hold Manufacturer Responsible for Quality. Make Sure Manufacturer is Backed by Research.

What To Look For — Very simply, the result you want is a balanced finish. It should have the right combination of properties or qualities to do its intended job satisfactorily. But the desired properties of a prime coat may be, and usually are, quite different from those of a top coat. By the same token, the importance to place on the various qualities will vary from job to job depending on the end use of the product.

TABLE 1 HOW TO RATE PRIMERS

(Laboratory and Panel Exposure Tests)

	Relative Value Est. by Tests			Weighted Value*	
	Primer "A"	Primer "B"	Relative Importance, pct.	Primer "A"	Primer "B"
Impermeability to Moisture and Gases	9.5**	6	5	47.5	30
Resistance to Corrosion and Weathering Unprotected by Topcoats	9	6	10	90	60
Inhibitive Effect in Preventing Corrosion Under Topcoats	9	8	25	225	200
Salt Water Resistance	8	6	5	40	30
Flexibility and Adhesion	8	7	20	160	140
Abrasion Resistance	9	6	5	45	30
Build and Spreading Rate	7	9	5	35	45
Speed of Dry	9	5	10	90	50
Ease of Application	7	9	5	35	45
Flow and Leveling	9	6	5	45	30
Package Stability	8	6	5	40	30
			100	852.5	690

* To obtain "Weighted Value" multiply percent of "Relative Importance" by "Relative Value Established".
** A Rating of 10 is perfect.

From the standpoint of paint quality alone, it is evident that Primer "A" is worth 23.5% more than Primer "B".

No one coating material suits all jobs nor does it have all desired properties. The formula must be a compromise.

There are a number of qualities to look for in a balanced primer. First, you'll want an inhibitive effect to retard or prevent corrosion. Then you'll need durability, plus retained adhesion and flexibility. Also look for good hiding power and a fast spreading rate.

The time it takes for a paint to dry is important too. Does it apply easily? Does it have good flowability and leveling? These are other questions you will want answered. If you're planning to store the paint for a time, package stability must be considered.

Top Coat Needs—Most of the qualities of a balanced primer apply equally to the top coat. In addition, appearance, both initial and retained, holds high priority. The top coat should also have good abrasion resistance. Impermeability to moisture and gases is another essential quality.

Just how do you go about getting a balanced coating? This job seems perplexing at first, but there is a proper way of accomplishing it. You can call it the engineering approach. Based on the end use of your product, and consequently the paint, determine which qualities are essential. Then rate these qualities on the basis of their relative importance.

Quality Ratings—You can measure some qualities accurately. Among these are impermeability, gloss, drying time, spreading rate, etc. Other qualities, such as inhibition, durability and gloss retention can be determined by comparison. Either way, it's a good start toward judging performance. Table I shows a way of establishing the suitability of a primer for a specific use.

All this testing and evaluating may seem like being extraordinarily fussy. It may give you a slight gain here or there. But is it worth that extra care and expense? Your answer will eventually come from your customers. Remember, though, that they're not interested in a second-best or third-best in the type of product you sell.

What Buyer Wants—There's no doubt that your salesman can get an order the first time, or even a second or third time. Then comes the day that when he can't put his foot in the door. His customer is now out for full value on every dollar he spends for a good finishing job. Briefly, he wants what you should have given him—low initial cost, low maintenance cost, long life and good appearance.

Keeping abreast of new developments and improvements in paints, lacquers and varnishes gives you some assurance of a healthy future. It could be that your finishes were among the best; your competitor couldn't match them. At least not until he found a new material. Remember that paint technology of today holds little resemblance to that of 20 years ago. Moreover, it's moving ahead at an accelerated pace.

Lot at Stake — Paint manufacturers and equipment producers are eager to help you for several reasons. First, of course, is the fact that the paint business is a sizeable one, but also highly competitive. In 1956, paint, lacquer and varnish sales reached close to $1.5 billion. This year, they'll be around $1.6 billion. Anytime a paint manufacturer can help you reduce your painting costs, it represents a potentially larger market for his products. Take advantage of it.

Packaged paint has only a potential value. Its value becomes real after it has been used to produce a satisfactory dry film. Paint manufacturers are fully aware of this and stand ready with technical and field service facilities. They know that careful paint selection in itself is no answer to lower costs and better performance.

How to Buy — You may have entertained some thoughts of buying paints according to specifications. Many products are bought on that basis. And isn't it the sure way of getting what you want? Yes—If you're buying packaged paint. No —if you desire the very best in dry film performance.

Once you specify what you want in a paint, the responsibility for performance lies in your lap. To the paint manufacturer, it's a tip-off that you intend to buy from the lowest bidder. All he has to do is comply with the specifications you set up for him. You've left his hands free to cut corners. You pay for performance, yet you can't be sure how the paint will perform.

It may be that you hope to acquire a better and more uniform quality of paint by writing a specification. Perhaps it is your desire to get it at a better price per gallon. Whatever the motive, a paint which fulfills your specifications and the actual value of a dry paint film may be miles apart.

What It Lacks—The best written specification can't provide for the essential qualities in a paint. Nor will it take care of the proper balance of these qualities. How would you get the best available product if you specify the ingredients? Or how will a specification help you capitalize on the manufacturer's technical background and experience?

The plain fact is that it won't. Furthermore, it acts as a barrier to the paint manufacturer in seeking out a better product. By the same token, it limits you in searching out a finish better than the one you've been using or in improving the application of it. Either way, it's an invitation for your competition to overtake you.

TABLE 2 SOME HINTS ON STORING AND HANDLING PAINTS

ACTIVITY	EQUIPMENT REQUIRED	PURPOSE	ACTION AND CONTROL	NOTES
RECEIVING	Materials Handling Equipment: Trucks (hand or power), dollies, traveling hoists, etc.	To handle economically materials in drums, barrels, and other packages.		Area used should be well-lighted for safety. Location should be chosen for convenience in unloading incoming finishing materials and proximity to area where they will be used.
	Tanks, Vats.	To store bulk finishing materials.		
	See "Safety precautions—Against Fire".			
	Metal Files and Records system.	To record receipt of materials and their condition when received.	Containers should be marked to show date or order of receipt.	
	Sampling Equipment and Metal Cabinets.	To draw samples of materials, as received, to be transferred to Quality Control Department.	Check against user's specification for finishing material.	
STORING	Materials Handling Equipment: Trucks (hand or power), dollies, traveling hoists, etc.	To provide efficient handling of materials in storage areas.	Positive arrangement should be made to insure materials being used in the order of their receipt—first in, first used. Storage methods and records should permit supervisor to determine at a glance quantities of important materials on hand.	Ample space and suitable racks should be provided for storing drums and other containers. Floor markings help to route transfer of materials efficiently. Store materials where moderate temperature range can be maintained, preferably between 60° and 75° F. Extreme temperatures may cause some coatings to deteriorate. Keep rejected or reclaimed materials where they cannot be used by mistake. Store returnable drums where they cannot become lost or destroyed.
	Properly protected Storage Tanks.	To receive materials handled in bulk.		
	Records system.	To show what quantities and types of materials are on hand at all times.		
	See "Safety Precautions—Against Fire".			
	The responsibility for mixing and issuing finishing materials should be assigned to one man in the Paint Department			
MIXING	Electrically or air driven propeller agitators. Equipment for rotating or agitating drums. Measuring Equipment.	To mix finishing materials thoroughly and to reduce them correctly.	Before mixing, paint which cannot be stored under ideal conditions, so becomes excessively hot or cold, should be brought into Mixing Room and kept there until it reaches normal room temperature. Agitate paint thoroughly before reducing. Be certain correct reducer is used. Add reducer to paint (not paint to reducer) slowly and in small amounts. Agitate thoroughly after each addition. Strain reduced paint to remove lint, dirt and other foreign matter introduced while mixing. Be certain that each material is reduced to a standard viscosity and, when recommended, to a standard specific gravity (Baume reading) predetermined as correct for the particular coating and the specific application method to be used.	Avoid agitating paint by blowing air bubbles through it. Double check to be sure reducer to be used is the correct one before thinning paint. Incorrect reducers may spoil it. Reduce and mix only enough paint for one day's use. Keep paint and reducer containers covered tightly when not in use to prevent evaporation of volatile solvents and skinning of paint. Spillage means waste and may create hazards. Clean up immediately and thoroughly any spillage that does occur. Use all material you receive. Check emptied shipping containers for complete drainage before returning them to the finish supplier.
	Pumps, siphons, safety faucets, etc.	To transfer materials from containers to and from mixing tanks.		
	Records system.	To indicate the date materials are issued for use, the amount of reduction and type of reducer used, the viscosity (and in some cases the specific gravity) to which they are reduced, and the use to which they are put.		
ISSUING FOR USE	Pressure tank liners, inserts, or tote cans. Circulating system.	To transfer material to point of consumption.		Long radius bends in piping will reduce fluid friction. Desirable to mark or code containers to facilitate identification of contents.
	Records system.	To record consumption by job, period, lot, etc.	Appropriate requisition system should be used.	
SAFETY PRECAUTIONS—AGAINST FIRE	Fire-resistant structure. Alarm and fire-extinguishing equipment. Explosion-proof motors and switches. Heating equipment so designed that it cannot cause fires by malfunctioning. Adequate ventilation. Electrically grounded mixers, tanks, pipelines, etc. Fusible links on dip and solvent tank covers. Non-sparking tools. Waste disposal equipment.	To prevent fires and to limit fire damage.	Personnel should be well-trained: 1. How to avoid fires. 2. What to do in case of fire. Periodic, rigorous checks should be made by top supervisory personnel to insure compliance with local fire prevention codes and plant measures, and proper maintenance of equipment. Inspection should be made by insurance agency and or local fire department. Periodic fire drills are desirable. Workers should be trained to avoid spontaneous combustion, including care of paint-spattered clothing and especially appropriate disposal of waste and rags. Scrap cans should be emptied frequently and regularly.	If practicable, store paint in a separate, fireproof building. If storage must be under main plant roof, isolate area by firewalls and automatic fire doors. Provide thorough ventilation to prevent accumulation of hazardous vapors. Withdraw exhaust fumes from bottom of room. Design ventilating system to prevent spread of flames in case of fire. Where inflammable materials are stored in tanks, connected underground "dump tanks" are a desirable auxiliary. Good housekeeping results in a cleaner, safer and more pleasant place to work. Keep equipment and floors clean and in good order.
SAFETY PRECAUTIONS—FOR HEALTH	First aid equipment: Respirators. Instructional charts, posters, signs.	To safeguard personnel and prevent lost-time due to accidents and illness.	Personnel should be instructed relative to effects of solvent vapors, etc., and cautioned to prevent unnecessary skin-contact with liquids. Inspection by local or state health authorities is desirable. Instruction should be given in correct handling of heavy objects.	Personnel should be watched for peculiar allergies to solvents and finishing materials.

Ways to Get Better Finishes Economically

Keep It Clean: Good housekeeping in the work area is essential to good finishing. Glidden photo.

A well formulated material for a specific end use is one factor in getting a good finish.

But a more expensive material that is improperly applied only raises your costs.

Here are some hints which will help you to get everything you paid for.

▪ Buying a balanced paint fulfills only one of the four basic requirements which will lead to a high quality finish. But even this advantage can be wiped out by your failure to prepare the surface properly. The same holds true when you don't apply the finish properly.

Proper surface treatment is a must if you expect to retain the qualities that have been engineered into the paint. Inadequate surface pretreatment will not only rob you of the performance for which paid, but you'll also see your application costs skyrocket. Table 3 lists recommendations for cleaning and preparing steel surfaces.

Probably the most fertile area for savings—or losses—is in the application of the finishing materials. In spraying, for instance, 60¢ of every dollar you spend for material can be wasted through faulty practice.

Watch Temperature—Paint temperature has a direct bearing on spraying cost per unit. Chilled paint increases its viscosity, resulting in orange peel or dry spray. Too warm a paint is just as bad. It results in runs and sags, wasting material and labor. The ideal paint temperature for spraying falls within the range of 78° to 85°F.

High air and fluid pressures don't speed up the job. On the contrary, they cause overspray and waste. There are right pressures for each finishing material.

Here's how high pressure will affect your material costs for one hour of operation if you use an enamel costing $3.00 to $3.75 per gal. At 60 psi on air and 6 psi on fluid, it will cost $14.20. Increase air pressure to 90 psi and hold fluid pressure at 6 psi and the cost

will jump to $16.33. At 90 psi on air and 15 psi on fluid, it'll cost you a healthy $28.40 per hour. That's for the material alone which doesn't take into account any loss resulting from overspray.

Gun's the Thing—Make certain that the sprayhead assembly is the right one for the job. Also, that it's properly adjusted. Otherwise, two or three strokes of the gun will be needed to do what should normally be done with one stroke. Avoid using a spray pattern wider than your surface. Keep in mind, too, that dirt and dry paint in the gun can be just as troublesome as poor adjustment.

Another dollar-saving technique is that of keeping a proper nozzle-to-work distance. About 8 to 10 in. for synthetic enamels, and 6 to 8 in. for lacquers, are considered correct work distances for hand spraying.

Aim the gun straight at the work surface. A tilt one way or the other wastes paint. It also wastes time and results in non-uniform coating thickness. If the workpiece has an irregular shape, follow its contour, applying the same principles.

Don't Be Trigger-Happy—Hold the trigger only when you're on target. It's a habit that will help to avoid overspray. Use smooth strokes, allowing time for adequate film buildup. Try to establish a spraying procedure by first banding in the ends with vertical strokes. Then spray the remainder of the surface with horizontal strokes, beginning the stroke and then pulling the trigger.

Real money-saving lies in your ability to spray a uniform film of the **correct** thickness. Too thick a film wastes material; too thin a film increases the number of rejects and causes unnecessary reworking. Sometime it may lose a few customers. Avoid this by establishing film-thickness standards, then run regular checks. Part III of this article describes instruments which will enable you to do this quickly and easily.

Smooth Operator: Note how this operator holds spray gun at right angle to work and at proper distance. Use of the proper technique gives him a good finish without wasting materials. DeVilbiss photo.

If your shop has no such instrument, check film thickness with a micrometer. It's quite simple and accurate. First, measure the combined metal and dry film thickness. Then remove a little of the paint film and measure the metal thickness alone. The difference between your first and second measurements is the film thickness.

Records Help—Two simple sets of cost control records will help you to cut down on extravagant practices. One of these would list the rejects in the day's production. The other would record material usage. Both could provide essential trouble-shooting data.

The reject record, though simple, has proved to be valuable to shop foremen and superintendents. The sheet lists all rejects by type from the day's production. Causes for some rejects are obvious. In other cases, it may provide a clue to the causes. Either way, it gives you an idea of how much rejects are costing you. Operators take greater care in their work when they know that you're checking them for work quality.

Keeping a record of material consumption should get special attention. Efficiency between individuals, and from job to job differs. Sometime the amount of material used varies by as much as 50 pct. It's certainly a big area for savings.

Here's what you can do. Figure out how much area is to be covered. Determine the coverage you can expect from a given material. Then establish how much material is needed for coating a particular piece efficiently.

Set Quota—Establish a paint allotment for each operator based on the number of units he is to spray. When the job is completed, compare the amount used with the established allotment. This will serve as a guide to an operator's efficiency.

Trouble-shooting, and the speed with which you can correct difficulties, can either halt your production

(Continued on Page 116)

TABLE 3 CLEANING AND PREPARATION OF STEEL BEFORE FINISHING

PURPOSE	METHOD	MATERIALS USED	EQUIPMENT	OPERATIONS	ACTION EXPLAINED
TO CLEAN	Blasting	Clean silica sand, or metal shot.	Barrel, table-type, or automatic blast cleaning equipment.	Expose all surfaces to blast of sand or shot. Wipe surfaces thoroughly.	Mechanical action removes grease, dirt, rust, etc. Tends to pit surface and is not suitable for smooth or thin gage metal. Usually used on castings and forgings.
	Burn-Off	(Suitable fuel)	Oven or Open Flame at 450° F. to 600° F.	1. Expose metal surfaces to high temperature in oven or open flame. 2. Wipe thoroughly with tack-rag. (Note A)	Oil and grease are burned off. Tack-rag wiping removes alkaline ash left by combustion of oil or grease. If soap-type greases are present, burn-off should be followed by a chromic acid solution rinse to neutralize alkaline deposits left.
	Infra-red Degreasing	(None)	Infra-red Oven.	1. Heat surface to 550° F. for 2½ min. 2. Cool, and clean with air-blast, or wipe. (Note A)	Same as for "Burn-Off" above.
	Solvent Cleaning	Solvents: Mineral spirit or N-Naphtha	Tanks for dipping (Solvent recovery system may be used) or provision for applying solvent by spraying, brushing, or wiping.	1. Immerse metal in solvent. (Note B), or brush or wipe surface with solvent. 2. Wipe dry or air dry. Wiping must be thorough. (Notes B, C)	Solvent cuts away oil, grease, cutting compound, etc., and flushes off other loose foreign materials present.
	Vapor Degreasing	Solvent: Trichlorethylene	Vapor Degreasing Machine.	1. Suspend in chamber containing solvent vapor. (Note D) 2. Wipe dry. (Note C)	Similar to action of "Solvent Cleaning" above. Vapor condenses on metal, washes off soluble oil, grease, etc. Heat promotes solution of oily contaminants.
	Alkali Wash	Compound based on caustic soda (Proprietary materials commonly used may contain wetting agents, etc.). Ample Rinse Water.	Dip Tanks or power washers for spray applications.	(1) Immerse steel in solution of alkali. (2) Rinse thoroughly. (3) Dry at once. (Note E)	Alkali converts grease, oil, etc., to soluble or emulsifiable compounds removed by rinse. Does not remove rust or mill scale. Does not usually etch. (Note F)
TO CLEAN AND ETCH	Electrolytic Cleaning	Special acid or alkaline solutions. (Note G) Direct current.	Special Electric Tank Equipment. (Note G)	(1) Pre-clean. (2) Clean electrolytically. (3) Rinse. (4) Dry.	Work may be anode or cathode; evolution of hydrogen at work surface aids in removal and emulsification of grease film, dirt, etc.
	Pickling	Dilute Acids: (See Note H) Ample Rinse Water.	Pickling Tanks (stainless steel, wood or ceramic).	(1) Immerse steel in pickling solution. (2) Rinse well in clear water. Wipe or scrub as necessary. (3) Dry at once. (Note J)	Acid cuts grease, oil, etc., and produces action which forces off mill scale, rust, dirt, etc. Pickling roughens the surface. (See Note H)
TO CLEAN AND NEUTRALIZE	3-Stage Wash Alkaline Agent	Alkaline cleaning agent for hot-water spray or dip. Cold rinse water. Hot rinse water containing chromic acid. (Note K)	3-Stage Industrial Wash Machine (spray type, or dip tanks.	(1) Alkaline hot spray. (2) Cold tap water shock rinse. (3) Spray with hot water containing chromic acid. (Note L, N)	Action same in principle as Alkali Wash described above. Spray increases effectiveness of action. Chromic acid passivates surface. (Note L, M)

PURPOSE	METHOD	MATERIALS USED	EQUIPMENT	OPERATIONS	ACTION EXPLAINED
TO CLEAN AND NEUTRALIZE	Emulsion Cleaning (Petroleum Solvent Type)	Emulsion Cleaner (Petroleum product such as kerosene, with emulsifying agent). (Note O, S) Hot rinse water, Lukewarm rinse water containing diluted chromic acid. (Note Q)	3-Stage Industrial Wash Machine (spray type), or dip tanks.	1. Hot emulsion spray. 2. Hot water rinse. 3. Lukewarm water rinse. (Note P)	Solvent acts on oil and grease. Dirt and other contaminants emulsified and removed. Microfilm of oil is left on surface. Chromic acid passivates surface. (Note Q) This method recommended prior to some methods of phosphating. (Note P)
TO CLEAN, ETCH, AND INHIBIT	Acid Etch (Note S)	Agent containing phosphoric acid, usually with some combination of inhibitors, emulsifying agents, wetting agents, and solvents.	Provision for brushing, wiping, dipping, or spraying agent on surfaces to be treated.	1. Pre-clean to remove gross contaminants. 2. Apply agent. 3. Remove excess of agent. (Note P, R)	Removes minor types of soil from the surface. Leaves slight film of phosphate salts on surface, a desirable condition. (Note R)
TO CLEAN, ETCH, INHIBIT, AND NEUTRALIZE	Phosphating, phosphate deposition (Note S, T)	Solution of acid phosphate salt. Rinse water. Dilute chromic acid solution.	Dip tanks with provision for heating; or equipment for spraying.	1. Pre-clean thoroughly with alkali or emulsion cleaner or combination thereof. 2. Clear over-flowing water rinse. 3. Immerse or spray with phosphating solution at elevated temperature. 4. Clear over-flowing water rinse. 5. Dilute chromic acid rinse at elevated temperature. 6. After drain and blow-off, evaporate water from surface in dry-off oven to prevent rust.	Phosphate salts react with the surface of the steel to form and/or deposit thereon a phosphate material in crystalline form.
	Phosphating, phosphoric acid method (Note S, T)	Solution of phosphoric acid and acid phosphate salt. Rinse water. Dilute chromic acid solution.	(Same as above)	(Same as above)	Phosphate solution reacts with the surface of the steel to form and/or deposit thereon a phosphate material in amorphous form.

(Note A): Wiping must be thorough to remove charred residue.

(Note B): Some solvent remains on surface of work upon completion of dipping or wiping, and this solvent contains dissolved oil or grease, which is redeposited upon the surface when the solvent evaporates. Fire hazard is created.

(Note C): Wiping cloths may cause a lint problem.

(Note D): Not well suited to conveyorized operation. Solvent expensive. Escape of solvent creates toxic hazard. Escape of any solvent to flame produces hydrochloric acid, which destroys quality of paint film. Action may leave iron chloride and carbon residues on surface of ferrous metals; these residues must be removed.

(Note E): Metal is mechanically clean, but subject to rapid rusting after wash. Rinse must come immediately after treatment to prevent deposit of salts on steel (water-spotting).

(Note F): Agitation by air or boiling usually employed to increase effectiveness of tank operation. Contaminants which are neither emulsifiable nor saponifiable and which are not rinsed, scrubbed, or otherwise removed, remain on surface.

(Note G): Electrolytic processes are developed as proprietary systems.

(Note H): Conventional pickling, using acids such as Hydrochloric, Nitric, Sulphuric, etc., does not leave surface in suitable condition for organic finishing. Follow pickling by operations to remove residual deposits.

(Note J): Metal is thoroughly clean, but subject to rapid rusting, after pickling. Surface left is slightly pitted and uneven. Borax must not be used in rinse prior to organic finishing.

(Note K): This method, and others employing chromic or phosphoric acids or their salts, represent a distinct concept of metal preparation differing fundamentally from those previously presented. This concept goes beyond mere cleaning of the surface. The systems employing chromic or phosphoric acids etch the surface of the metal and leave a deposit thereon, making the surface less reactive chemically to air and moisture, and providing a "tooth" for the organic finish. These results can be achieved by use of a variety of chemical agents, applied in various ways, but the steps shown in the tabulation indicate the principles involved.

(Note L): Chromic Acid also neutralizes effect of alkali salts left on surface.

(Note M): Not used thus prior to phosphating; any sequence which might introduce chromic acid into phosphating bath is avoided.

(Note N): In all systems using water, surface must be thoroughly dried and tack-ragged before applying finish.

(Note O): Various solvents and emulsifiers may be used.

(Note P): In methods employing water, surface must be thoroughly dried and tack-ragged before applying organic finish.

(Note Q): When this method is used before phosphating, any sequence which might result in introducing chromic acid into phosphating bath is avoided.

(Note R): Effectiveness is largely dependent on thoroughness of man scrubbing on the cleaner, and on absence of contaminants insoluble in acid.

(Note S): This method and others employing chromic or phosphoric acids or their salts represent a distinct concept of metal preparation which goes beyond mere cleaning of the surface. The systems employing chromic or phosphoric acids etch the surface of the metal and leave a deposit thereon, making the surface less reactive chemically to air and moisture, and providing a "tooth" for the organic finish. These results can be achieved by use of a variety of chemical agents, applied in various ways, but the steps shown in the tabulation indicate the principle involved.

(Note T): The two methods briefly outlined here represent several phosphating systems in use.

Turn Page

Some finishing faults stem from inadequate mixing of material. When you're not sure, mix the material—then mix it again.

Continued from Page 113
or result in tremendous savings. The idea is to spot trouble before it starts.

One of the common faults in spraying is the orange feel effect. It's a surface roughness which has nothing to do with foreign particles in the film. Unsatisfactory atomization by the gun is the usual cause for this.

For proper atomization, check your air supply. It should be giving you 9 to 10 cu ft per minute per gun at a pressure of 50 to 60 psi. This should be adequate for complete atomization.

Faulty handling of the gun can be another cause. Use arm action, rather than wrist, to get long strokes. Again, watch the gun-to-work distance and the spray-to-surface angle.

Dirt the Culprit—Dirty work surfaces invite trouble. Oil, grease, water and other contaminants can cause poor adhesion in the form of peeling. Proper cleaning is essential, but once a surface is clean, you must keep it that way. Even fingerprints can cause film failure. Avoid it by wearing clean gloves.

Certain metals have inherently poor surfaces for paint to adhere. This is due to the nature of the surface rather than surface contamination. Cadmium and zinc plate, and highly polished surfaces are among these. Consider phosphating, or check with your paint supplier, for a proper pretreatment.

A rough, dirty finish is usually a sign of spraying over a dusty or moist surface. Some shops avoid this by keeping the spray room supplied with a half-pound pressure of filtered air.

Wiping the surface with a "tack" rag just before spraying is most effective. You can buy them. You can also make them by saturating the cloth with semi-drying varnish. Wring out the excess and allow the cloth to dry overnight.

Another suggestion for overcoming roughness is to strain the finishing material just before you use it.

Customer Complains—Poor drying of the film is a serious enough problem for the shop. But it's a fault which is apt to get complaints from customers.

Several causes can contribute to poor drying. Too thick a paint film is one. Improper or incomplete precleaning is another. It's important, too, to keep the drying area properly ventilated. If you're using a drying oven, it's quite possible that oven temperature is too low or the drying cycle too short.

Poor hiding power of a paint means rejects—and higher costs. Assuming that the film thickness is normal, it then boils down to the inability of the pigmented finish to properly hide the surface. This in no way means that the material, as delivered, is unsatisfactory. Lack of pigment in the film may be caused by the addition of too much thinner or insufficient stirring of the material prior to application.

Since hiding power is closely related to film thickness, faulty application may be another cause. Keep in mind, too, that low temperature increases the material's viscosity. If such is the case, avoid adding thinner until the paint reaches the recommended temperature for application (78° to 85° F).

Mix Again — Off-color troubles also stem from inadequate mixing. Remember that pigments settle out, robbing the paint of its true hue. With white and light-shade enamels, too high a drying oven temperature may be the cause. When you compare your finish with a standard, do it in daylight so that your judgment isn't influenced by other colors around you.

If you're working with lacquers, "blushing" may be one of your most common problems. This is a whitish appearance of the film surface. It's cause is closely related to weather conditions. In warm, humid air, evaporation lowers the film temperature, causing moisture to collect on the surface pretty much the way moisture condenses on a cold glass.

Water and lacquer don't mix. The water forces the pyroxolin in the lacquer out of solution, leaving a whitish cast. The manufacturer of thinners can include more rich solvents which will retard "blushing," but expect to pay more. This approach may be desirable during the troublesome seasons. It may be the only one.

Pinholing—Appearance of tiny holes in the paint film is a signal to look for oil or water in the compressed air line. Prevention may be possible by (1) opening the air transformer valve as often as necessary to drain collected moisture and (2) by opening the petcock on the air storage tank at regular intervals to remove oil and moisture accumulations.

If the same problem occurs when you're spraying lacquer, your source of trouble may be elsewhere. Avoid cool drying areas when humidity is high. Pinholing can also be caused by using a combination of a fast thinner and heavy films. In this case, avoid the fast thinner.

With some baking enamels, use of the wrong thinner will cause pinholing. If your problem still persists, check the spray gun to see that you're getting proper atomization. Too large a fluid tip may be your trouble. If it is, use a smaller tip or increase the amount of air.

Many of the principles which apply to spray finishing apply equally as well to the hot-spray and steam-spray techniques, and to dip coating and flow coating. Put them to use and you're bound to save on every unit you produce. You can't overwork them.

Keep Quality in Line by Control

A number of variables stand ready to prevent you from getting the most from an "engineered" finish.

Ignore them and you're bound to run into trouble and expense. Guard against them and you'll stretch every dollar spent on finishing.

Here are some tests to guide you to a better finish.

▪ Getting an "engineered" coating only begins with a well formulated paint. Even after you've established successful techniques of application, it's often difficult to get consistent results time after time. Too many factors stand ready to change the course away from good finishing. Your best bet is to keep these factors under control by constant and careful checking.

There are a number of qualities and properties to watch. Some can be measured accurately; others must be judged by comparison or experience. Controlling these qualities and properties will result in better dry film performance.

Reliable testing begins with a reliable sample . . . one having uniform film thickness and without flaws. For some tests, it's necessary to apply the film by the same method used in production. However, other tests require more accurate means for acquiring film uniformity.

Checks Roughness: Portable and simple to use, this instrument quickly indicates surface roughness of a finish. It's called a Surfindicator.

Spin Sample — One of these methods uses a polished glass disk which is placed on a turn-table. The variable-speed motor drive is then adjusted to the correct number of revolutions per minute (predetermined by trial runs). When a given amount of paint is poured slowly on the center of the disk, centrifugal force distributes it evenly over the entire surface. This is done for a prescribed time, and the faster the disk speed, the thinner the film becomes.

The film spreader is another device to prepare a uniform film. It's a simple device, the working part being a bar-like blade. A regulator on each end of the blade raises or lowers the blade edge in relation to the flat surface of a polished glass plate over which it is drawn. With it, film thickness can be controlled to within 0.0001 in.

In using the film spreader, the knife is placed at the top of the panel and drawn forward over a generous amount of enamel or lacquer placed on the panel. As the

Measures Gloss: Called a Goniophotometer, this device measures gloss of a finish by reflection of light. Photo by DuPont.

knife is moved along, a constant depth of enamel passes under its blade, forming a uniform film.

How Thick?—The production line has at least two reasons for being interested in controlling film thickness. The first has to do with providing the required degree of protection, durability and appearance. The second involves cost. Even though paint films are measured in thousandths of an inch (mils), a fraction of a unit increase in thickness jacks the cost up. At the same time, it can create some extra finishing room problems.

Two thickness gages are in widespread use. They are the Aminco-Brenner Magne-Gage and General Electric's Enamel Film Thickness Induction Gage. Both give accurate results and almost instantaneous readings.

Here's how the Aminco-Brenner instrument works: The user rests the box-like part of the instrument on the coated face of the panel. A bar magnet at the bottom of the gage, by attracting the underlying steel, contacts the paint film. Then, by turning a dial on the gage, tension is applied to a spring attached to the magnet. The tension exerted on the spring to overcome magnetic attraction is an index of paint film thickness. The dial reading is interpolated from prepared charts to provide a thickness reading to within 0.0001 in.

Different Principle—The General Electric gage also works magnetically but not in the same way. Its dial gives a direct reading, also in tenths of a mil.

This instrument has a head which sets up a magnetic field. Measurement comes about by the resistance created by the thickness of the coating. Before measuring the paint film, the gage must be standardized. This is done by placing the head on non-magnetic foil of known thickness. For the meter to register, the foil must be placed on a magnetic surface. The meter is then adjusted to the foil thickness. To determine paint film thickness, the head is simply transferred from the foil to the sample under test.

Both the General Electric and Amnico - Brenner gages measure non - magnetic films on ferrous metals. They will not work on finishes over nonferrous metals.

Measure Viscosity—This is a term applied to fluid-properties of liquids—in this case, paints, lacquers, varnishes and the like. To those dealing with finishing materials, it has special significance because on its control depends the ease of application and production costs. Where spray guns are used, for instance, there's a waste of effort and materials unless viscosity is properly adjusted. The benefits of dipping and flow coating would be impossible without control over viscosity.

It's probably due to the importance of this characteristic that so many tests have been developed to measure viscosity. Many of these differ only slightly from each other while some are entirely different in nature. Whichever method is used, temperature affects this characteristic and must always be controlled.

Common Methods—The efflux methods are in most widespread use for measuring viscosity. Among these are the Parlin Cup, Zahn Cup and Ford Cup methods. All measure the time it takes for a given quantity of finishing material to pass through an orifice of known diameter.

The apparatus for the Parlin Cup method includes a brass cup machined to an accurate height. This enables the column of liquid to exert the same pressure on the base of the cup at all times. After the cup is filled, the paint or enamel is permitted to flow through a tube of a given diameter into a graduate. The result is recorded in seconds for the time it takes for 50 cc to pass through the orifice. Temperature of the sample is held at 77°F.

In the Ford Cup method, the measuring device is similar to that used in the Parlin Cup method. After the cup is filled, the time of flow is also recorded in seconds. However, there's no measurement by volume. Flow time is recorded until the first break occurs in the stream. Sample temperature in this case is maintained at 80°F.

The Zahn Cup method is among the easiest to use. Many plants applying paints by spray or dip methods use it for guide control. In this test, the chemist submerges the cup in the finishing material, then quickly withdraws it. The

measurement of viscosity is the time in seconds between the moment of withdrawal and the first break in the paint stream. The temperature-viscosity correction is obtained from a correlation curve.

Clear Liquids Only — Widely used for varnishes, lacquers and other clear liquids is the Gardner-Holdt bubble viscometer. It's a fast method for determining viscosity since it eliminates the clean-up necessary after the efflux tests.

The viscometer is a tilting rack. On it is a series of glass tubes partly filled with non-volatile liquids in graduated viscosities, ranging from low to high. Each tube is hermetically sealed to entrap an equal amount of air at the top of the liquid. When the tubes are turned upside down, the air bubbles start upward. Bubbles rise rapidly in low viscosity liquids and slowly in high viscosity liquids.

The tubes are arranged by the rate-of-rise of the bubble, each tube representing an approximate viscosity in poises, and identified by a letter of the alphabet. To determine viscosity, place the sample in an empty standard tube calibrated to match the dimensions of the racked tubes. Bubble size is adjusted to match those of standard tubes. The sample tube is then sealed, and its temperature, along with that of the standard tubes, is adjusted to 77°F.

A reading is obtained by matching the rate-of-rise of the bubble in the sample tube against one of the standards. The sample may be, for example, ¼ of a bubble heavier than "G," the letter denoting the viscosity of one of the standard tubes.

Thick Liquids—Some pigmented finishing materials are so heavy bodied that it's difficult or impractical to use the Gardner-Holdt bubble viscometer. The bubble's rate-of-rise would be too slow, and the opaque liquid would make reading difficult. Efflux methods are also impractical in such cases.

That's where the Stormer Viscometer takes over. It's a mechanical device for measuring the consistency of heavy enameled-type paints. Testing is done by immersing a paddle-like rotor in the paint sample, always to the same depth The pull of gravity by a suspended weight whirls the rotor. A dial at the top of the shaft records the number of revolutions made by the shaft. The weight in grams needed to spin the rotor 100 revolutions in 30 seconds determines the viscosity value.

Check Drying Time — Knowing how long it takes a paint to dry is important to users and producers alike. To the user, such information tells him when a paint film is dry enough so that dust will no longer adhere to it. It's important, too, in terms of knowing when a painted product can be handled without marring it.

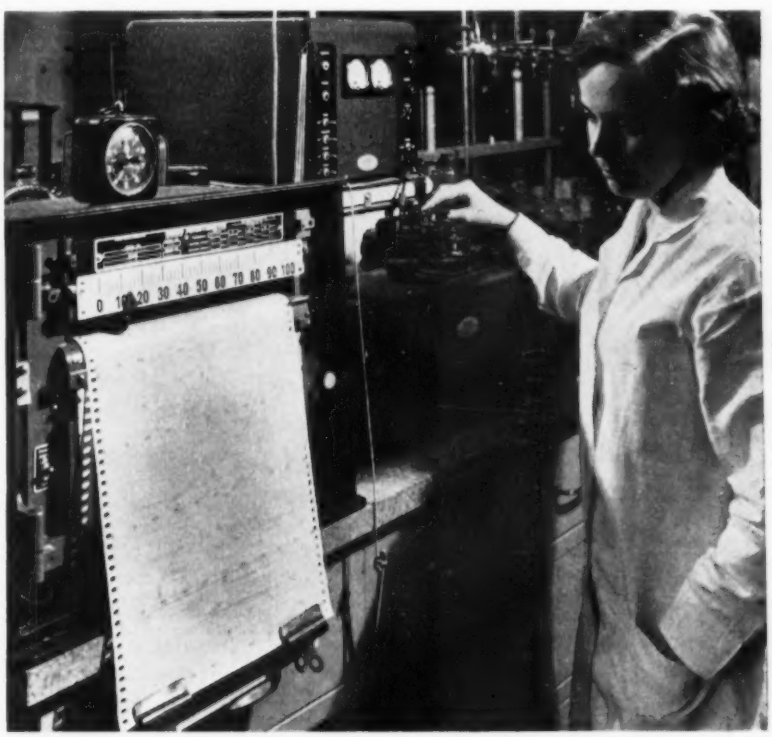
The paint producer's concern is to reduce drying time. To the user it means shorter processing cycles, higher production rates and lower floor space requirements. To do this, he must have some way of accurately measuring the time needed for films to reach the various stages of drying. Where many formulas must be evaluated, the Sanderson Drying-Time Meter performs very well.

How It Works — The Sanderson meter is fairly large, and situated in a constant temperature-humidity room. It has a series of turn-tables, each with a cone-shaped receptacle above it. In each cone is fine, clean sand.

The turn-tables mount glass disks coated with the material under test. It's important that the paint films be comparable in thickness. The cones are then positioned at the edge of each disk.

A gear-reducing unit drives each turn-table slowly. The cone, also coupled to the gear mechanism, forms a spiral-shaped path of sand on the painted disk. In the meantime, the paint is drying.

After a prescribed period of time,



Positive Proof: Small differences in composition of a finish may make big differences in performance. This Beckman Spectrophotometer "fingerprints" the material. Photo by DuPont.

the disk is removed, turned over and tapped to dislodge the sand. The end of the sand track is an index of "dust-free" drying time. The same disk is then spun under a weighted brush for 30 seconds to remove additional sand. The point to where the sand track has been obliterated serves as an index of "tack-free" drying time.

Effect of Solvents—The volatile content of a finishing material is usually a combination of solvents rather than one. The proportions in which these solvents are used bear directly on the application, performance and drying time of the paint film. Drying time, for example, can be shortened or extended to fit your production rate by properly balancing the solvents.

Stoppages and slowdowns on the finishing line are sometimes traced to the behavior of solvents in a paint. "Blushing" — common with lacquers — can often be eliminated by changing the proportions of solvents. Lack of smoothness in gloss enamels can be influenced by the evaporation rate of the solvents. Under some conditions, sags, runs, and pinholes result from solvents being out of balance.

Chemist's Job—If the chemist is to correct these faults, he must know the rates at which the solvents evaporate. One of the devices used for this work is an Evaporometer.

Here's how it works: The chemist places volumetrically measured samples of solvents in glass tubes. Also introduced into each tube is a jet of air, controlled for pressure, humidity and temperature. During evaporation, the tubes are horizontal so that the evaporating surface area is about the same for each sample.

At scheduled intervals, the chemist tilts the tubes to the vertical position to measure the remaining fluid. Loss of volume indicates to the chemist how a solvent will behave in a particular formulation.

Get Full Value — Every paint buyer wants his money's worth when it comes to the dry film. After all, it's the end product of his purchase.

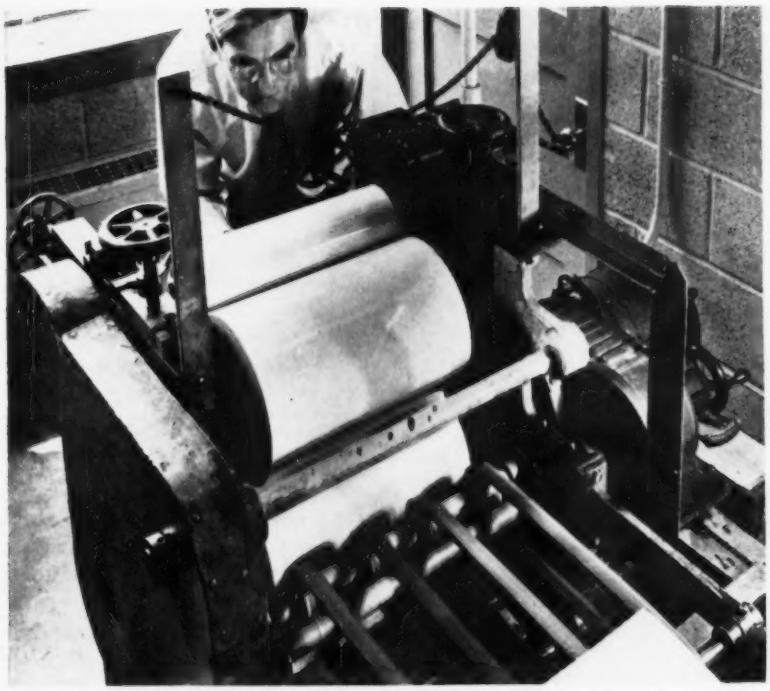
At least two tests can give him this information. One is the Gallon Weight test. It consists of weighing an accurately machined container which holds 83.3 cu cc of paint. With the weight of the container already established, it's a matter of calculating the weight of the paint in grams. This is translated into pounds per gallon.

If the Gallon Weight test shows that a sample is not up to weight, it warns of something having gone wrong, but it doesn't reveal how much film forming material is in the sample. In such cases, the chemist relies on the Percent-Solids test.

To determine solids content, the volatile portion of the sample is driven off in an oven held at 105°C (±5°). The sample stays in the

Top: Operator can check both high and low gloss finishes with this universal-type glossmeter. The information obtained is not only useful in production control, but in research as well.

Bottom: How wearable is a finish? This test gives the answer. Small brushes scrub back and forth thousands of times to prove the ruggedness, or lack of it, in a finish. DuPont photos.



Test How It Rolls: A finish may seem to work well but this roller-coating machine model proves it in production. DuPont photo.

oven until its weight remains constant. The percent of solids in the original sample is calculated from the weight of the residue.

Power to Hide — A good pigmented finish has the ability to hide the surface over which it is applied. Without that ability, production costs can climb sharply.

A device called the Pfund Cryptometer helps the paint chemist determine the highest degree of hiding power obtainable in a paint consistent with other film qualities. The device has two parts — one a smooth, ceramic surface equally divided between a bright white area and a deep black area. A scale is etched at the side of each area.

The second part is a clear glass slide with one of the short edges beveled. It's usually called the "wedge." The paint to be tested is placed near the center of the base plate on the side giving the most contrast. The glass slide is then placed over the enamel with its beveled edge at zero on the scale. The angle formed by the base plate and slide forces the paint into a wedge-shaped film ranging from very thin and transparent to thick and opaque.

As the wedge is slid away from the dividing line, film thickness over the line increases. When the line is hidden by the enamel, the wedge's forward movement is stopped. Hiding power in terms of square feet per gallon can be calculated from the scale reading opposite from the beveled edge of the slide.

Fairly Accurate — Results from the Cryptometer may vary from those obtained in actual practice. Nevertheless, it is quite accurate in indicating relative values when evaluating different products.

Gloss is another highly sought quality on many products. It imparts newness and sparkle. With it, a product acquires greater appeal. However, it does accentuate surface defects and therefore is undesirable for some products.

Whether a product requires a glossy finish or not, control over this quality is necessary for consistency of finish. It's often difficult to detect slight differences in gloss visually. More important perhaps is that cumulative errors, however slight, can result in considerable drift from an original standard.

Where gloss is important, an instrument called the Aminco-Scott Goniophotometer accurately measures the amount of light reflected from a painted panel. A light beam is focused on the panel. A lens catches the reflected light and projects it into a photo-electric cell which in turn activates a galvanometer. The Goniophotometer thus records the amount of reflected light. Before the test, the instrument is calibrated to a known standard.

Portable Tester — Another instrument for measuring gloss operates on the same principle. It's the Gardner 60° Gloss Meter. Results with this instrument are quite accurate for ordinary testing, but it loses some of its accuracy on low-gloss surfaces. It has the advantage of being portable.

Getting color agreement on an assembled product can create some tough problems — and a lot of confusion. Take, for example, the case of a firm making and finishing some parts of an assembly at one point, some at another, and assembling them at a third. Or the firm that takes some parts from stock and other freshly painted parts from the production line. How do such firms match color to get uniformity in the assembly?

Color standards can be maintained with an instrument such as the Beckman Quartz Spectrophotometer or with General Electric's Spectrophotometer, which is fully automatic. A quartz prism breaks up light, from a built-in source, into visible color bands. By adjusting the prism, the colored light bands, one at a time, can be projected onto a sample panel.

Measures Light — When a colored light band strikes the panel, some light is absorbed. Some is reflected into a photo-electric cell where it is converted to electrical energy and measured. To measure intensity of reflection from a sample

Igloo For Finishes: Inside this test apparatus, finishes undergo bending and twisting to check their performance in sub-zero temperatures. Operator works with insulated gloves. DuPont photo.

accurately, it's necessary to compare it with a standard of intensity. Carefully kept records for each wave length of light serve as positive identification for any specific panel.

Another instrument sensitive to color differences works in a way similar to the spectrophotometer. But instead of a prism to break up the light beam, it uses blue, green and amber filters to detect and measure color differences. It's the Hunter Reflectometer. Test results can be obtained rapidly since only three readings are necessary to show color differences.

Exposure Test Slow — For paint films going into outdoor use, there's no test like the one Mother Nature can give them. But it's slow in giving results — often, too slow to be of any practical value.

The accelerated weathering test serves as a partial answer. It can provide certain information quickly. The unit used for this test is a large cylindrical shell. In it is a carbon arc to produce ultra-violet rays. Temperature is held at 145°F.

A circular rack carries sample panels around the arc, making one revolution every two hours. Water is sprayed on each sample for 18 minutes of every cycle.

These are only some of the tests used to help keep the properties and characteristics of paint films within acceptable limits. Other tests provide equally pertinent information. The Moisture Impermeability Test, for example, tells the chemist how much water will pass through a paint film. There's also the immersion bath to test the effect of water on paint adhesion. The well-known salt spray cabinet tests paint films for corrosion resistance . . . or lack of it.

Check Vitality—Still other tests check the physical and mechanical properties of paint films. Finishes deteriorate with age without showing any visible early symptoms. Outdoor exposure tests are lengthy and impractical. So the chemist uses a device called the Scott Tester to give him the rate of deterioration in a much shorter time. Actually, it's a tensile tester with which he checks a paint film for strength. Results from tests made at regular intervals enable him to plot the rate of deterioration.

Good adhesion and a hard surface are not always indicative of a durable finish. Some films must withstand twisting and bending throughout their service life. Therefore, flexibility must be built into a film, otherwise it would crack and chip. Controlled bending of a sample panel in a conical mandrel reveals whether a finish is apt to fail in service.

Let Chips Fall—Household appliances in particular take a beating from all sorts of knocks. And if the finish chips off, it's not the knock that did it, the finish wasn't up to par. So the user suspects. To guard against this kind of thinking, the finish is subjected to an impact test in a guillotine-like device.

From Hot to Cold — Many finishes must withstand abrupt changes in temperature. Your car, for example, goes from a warm garage into a wintry blast. Or desks move from an ice-cold freight car into a heated warehouse. Will the finish stand up under such changes? Testing for cold-crack resistance provides the answers.

The essential property in still other finishes is abrasion resistance. There are various tests to check this property — some scrape with a stylus while others set up a virtual sand storm.

The paint manufacturing business is saddled with an infinite number of variables. Because of this, its problems are highly complex. But in spite of it all, finishing materials of today are far better than those of only 10 or 20 years ago. Select them with care, use them wisely and efficiently, and control their application. Then, and only then, will you get the best product finishes.

Acknowledgment — The editors thank the firms that assisted in the preparation of this article by supplying essential information. Among these are: Binks Manufacturing Co., The DeVilbiss Co., E. I. DuPont de Nemours & Co. and The Glidden Co.

Want Extra Copies?—A limited number of copies of "How To Get More For Your Organic Finishing Dollar" will be available upon request to Readers' Service Dept., THE IRON AGE, Chestnut and 56th Streets, Philadelphia 39, Pa.

Typical of the test equipment in the ACP Quality Control Laboratory is this Bell adhesion tester for determining how firmly the paint finish adheres to ACP Alodized aluminum.

ACP Process Standards ARE MAINTAINED

BY THESE ADHESION AND DUCTILITY TESTS

ANOTHER METHOD of determining paint adhesion is through distortion of the metal with an Olsen Cup Tester. This device indicates the resistance of the Granodine bonded finish to cracking.

ADHESIVE CHARACTERISTICS of ACP Lithoform are tested in this conical mandrel. Even under bending stresses (diameters range from ⅛ to 1½ in.) the paint finish on the Lithorized metal won't peel.

IMPACT TESTER STRIKES A TELLING BLOW for ACP Duridine® . . . indicates the ability of the paint finish on Duridized steel to resist cracking when the metal is deformed under a predetermined impact.

Behind the operation of an ACP chemical process in your plant is an efficient quality control organization. Physical tests of production or production-run test panels processed in your equipment are made on such devices as the conical mandrel, impact machine, Olsen cup ductility tester, and Bell adhesion tester. These determine the adhesion of the painted finish to the metal treated by the ACP chemical process in use. Other equipment tests weathering qualities, corrosion resistance, and abrasion resistance. All are part of the complete ACP customer service.

Ask us for more information about ACP chemical processes for treating aluminum, steel, zinc, brass, copper and other metals, either for protecting the metal or producing a bond for decorative and protective paint finishes.

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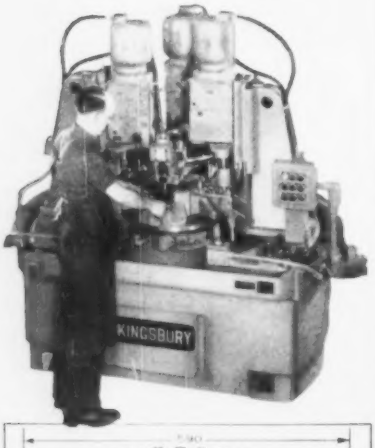
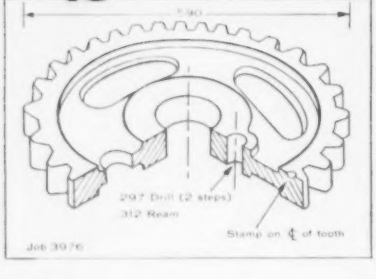




The operator merely loads and unloads this Kingsbury. The stamping device operates at his station. Two automatic units drill and one unit automatically reams. Drilling in two steps shortens the time cycle and increases production.

Kingsbury indexing automatics save money on simple jobs like this and on large complex jobs, too. Machines are all tooled, ready to produce. We invite your inquiry. Kingsbury Machine Tool Corporation, Keene, N. H.

KINGSBURY

INDEXING AUTOMATICS for high production drilling and tapping

TECHNICAL BRIEFS

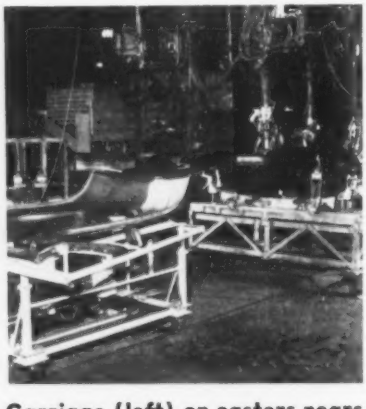
Special Carriages Move Stampings

Moving stampings to welders via air operated carriages speeds handling.

The units do away with manual carrying. One man now does the work of two.

After automobile hoods leave the main press area of a large assembler, the hood stampings are hung on an overhead monorail chain. This carries them to another department where reinforcements and accessories are spotwelded into place.

Handling from the conveyor to the welding fixtures formerly was done by two men. This was due to the stamping's bulky shape.



Carriage (left) on casters nears welding fixture.

Faster Method Sought — This transfer method was too slow. It involved more labor than thought necessary. So engineers at Buick's Flint, Mich., plant, where the operation takes place, sought a new method. As a result, they came up with an air operated carriage to move the stampings. This unit shuttles back and forth from a point near the conveyor to a welding fixture.

A duplicate carriage serves a second fixture. However, only one worker is necessary to load both carriages alternately.

The ram of an air cylinder powers it. When the carriage reaches the fixture, a second air operated ram pushes the hood over rubber rollers into the fixture. The two rams then retract. One of them attached to the floor pulls the carriage back to the reloading position. Both units travel on casters along a track.

Disconnects Easily — Although the hood is bulky, one man disengages it easily from the conveyor's carrier hook. In so doing, he lets the vertically hanging stamping drop onto a rubber block set in the floor.

With one end on the floor, the unloader inclines the hood until its upper portion rests against the rubber rollers at the loading end of the carriage. He then raises the lower end of the hood and easily pushes it over the rollers until it rests on the carriage. The rollers support most of the part's weight. This leaves the carriage ready for advance to the weld fixture.

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 105. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Magnet Grates Remove Iron Particles

Permanent magnetic grates separate accidential iron fines from finished zinc oxide at American Zinc Oxide Co., Columbus, Ohio. The grate, installed in a chute, protects finshed material from contamination. Material passes from a screw conveyor, through the grate, and into an elevator.

Powered with magnetic tubes of Alnico V, the non-electric grate revolves slowly through the passing flow of material. This prevents clogging or bridging. It breaks up particles that tend to cling together, and plucks out any stray iron fines which become firmly secured to the tubes.

Worker brushes iron fines from revolving grate's insides.

The grate is a new development of Eriez Mfg. Co., Erie, Pa.

Columbium May Better Gas Turbines

Columbium may provide a long sought answer to a problem in the production of gas turbine engines. This is the opinion of Dr. M. A. Steinberg, metallurgy department head of Horizons Inc., Cleveland.

His theory is this: If the application temperature can increase, the size of the engine can decrease, with no loss in power output. Today, however, materials used in the manufacture of these engines

Stainless Steel Finisher finds...

3M Abrasive Belts best for critical surface polishing

3M ABRASIVE BELT on a wide sheet polisher puts perfect surface finish on stainless steel sheets.

Thomson Stainless Steel Polishing Co., Berwyn, Illinois finishes and polishes stainless steel sheets to customer specifications. This company finds that with 3M Abrasive Belts they are able to provide any of five standard finishes to meet customer requirements. 3M Abrasive Belts enable them to fulfill these varying daily job requirements easier and faster than with ordinary belts.

Put 3M Coated Abrasive Belts to work on your flat polishing operations. They'll meet your finishing requirements and help you cut costs and increase production, too.

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can only withstand temperatures up to 1800°F. Thus, there is a serious limiting factor on the top power output possible.

How It Works—In the operation of a gas turbine, a compressor takes in air and compresses it to five to ten times normal pressure. This air is ducted into combustion chambers where fuel enters and ignites. This results in a considerable increase in volume of the hot gas. This then moves against the blades of a turbine wheel thereby generating rotation and kinetic energy. In a turbo-jet aircraft engine only a part of the gas power converts to rotational energy, which is used to operate the compressor; the remainder emits as a jet stream to provide propulsive force.

There are hundreds of blades in each turbine assembly which must stand the high temperatures of hot gases. Since the blades rotate within close proximity to the casing shell, any appreciable creep or oxidization of the metal blades has serious effects.

Steinberg notes that with greater heat resistance, higher temperature gases can be put into the turbine increasing the available power; aircraft then will have greater speed and range.

Stainless Pickle Rack Endures Sulphuric

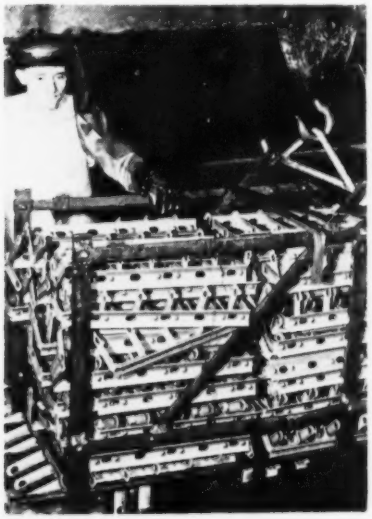
Pickling racks and hangers of a specialty stainless steel have already outlasted previous ones three times and they are still in use. The stainless stubbornly resists 5 to 15 pct sulphuric acid at 200°F.

Line Material Co., East Stroudsburg, Pa., uses the racks and hangers to support 1000 and 2000-lb loads of pole line hardware during pickling and galvanizing.

Stainless Switch — The original metal, recommended highly for resistance to dilute hot and cold sulphuric acid, lasted about two years.

When corrosive wear demanded replacement, the company tried items made from a specialty steel known as Carpenter Stainless No. 20.

The stainless rack, a welded framework measuring 6-ft long x 2-ft wide x 30-in. high, was installed six years ago. The stainless hangers were installed eight years ago. All of these stainless parts remain in use today; their users believe they will render several more years of safe service.



This stainless rack supports heavy loads during pickling.

The stainless is a sulphuric acid resisting steel with a type analysis of C 0.07 pct max., Mn 0.75, Si 1.00, Cr 20.00, Ni 29.00, Mo 2.00 min., Cu 2.00 min. It is supplied from Carpenter Steel Co., Reading, Pa.

Performance of the steel has proved so exceptional, the company has adapted it for other parts subject to corrosive action such as baskets, stirring rods, racks, etc.

Strong Casting Alloy Resists Corrosion

High-strength, corrosion resistance, and good mechanical properties are possessed by a new casting alloy. So reports Dr. M. G. Fontana of Ohio State University's metallurgy department.

Describing the alloy to the Technical Research Committee of the

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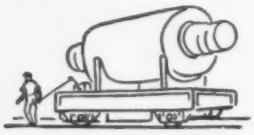
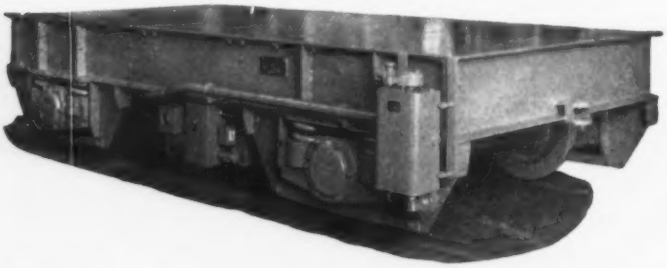
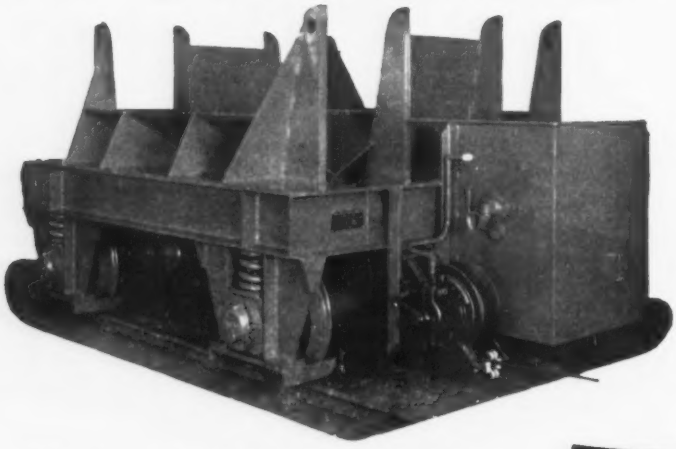


Atlas Safety-Type Transfer Cars are outstanding for moving heavy materials over short distances. Designed for storage battery, diesel or gas-electric, or cable reel service. Only one simplified control lever for safety. The car moves only when the operator holds the lever.



50-TON STORAGE BATTERY FLAT CAR



64-TON ELECTRIC FLAT CAR

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ENGINEERS MANUFACTURERS

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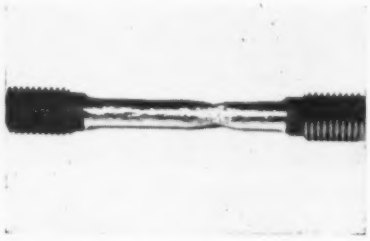
TECHNICAL BRIEFS

Alloy Casting Institute, Dr. Fontana told how the search for such an alloy led to many materials. Many of these exhibit high strength and hardness. However, they are considerably inferior in corrosion resistance to the regular 18-8 stainless alloys.

Corrode Quickly — Some metals examined show corrosion rates of 200 to 1000 mills per year in boiling 65-pct nitric acid. This compares with an average rate of 10 mills per year for 18-8.

Designated as CD-4MCu, the new alloy's corrosion rates are about the same as for 18-8.

Tests on two production heats indicate that the alloy has excellent mechanical qualities. Specifically,



Pulled tensile specimen of new alloy shows its ductility.

the elongation and reduction of area values reveal its high ductility. This is true even at about 300 Brinell hardness, tensile strength of 140,000 psi or yield strength of 100,000 psi.

Machines Well—The alloy has better machinability than 18-8 stainless, reports Dr. Fontana. It also has good welding, foundry, and grinding characteristics.

The metal has the following composition range: 25 to 27 pct Cr, 4.75 to 6.00 Ni, 0.04 C max, 1.75 to 2.25 Mb, 2.75 to 3.25 Cu, and 1 pct each Si and Mn max.

Discuss Rectifiers

The American Institute of Electrical Engineers' Industrial Power Rectifiers and Semiconductor-Metallic Rectifiers committees will hold a two-day joint conference on rectifi-

ers in industry in Chicago on June 4 and 5.

A highlight of the conference will be a panel discussion on application and maintenance. The symposium will cover: (1) low voltage electro-chemical, (2) low voltage plating, (3) high voltage electro-chemical, and (4) steel mill auxiliaries and maindrives.

Studies Wire Belt

A large wire cloth producer is issuing a report on a recent study of woven wire conveyor belts operating at 2050°F, the range in which copper brazing is performed.

The report tells how to increase belt life by: (1) reducing belt tension, (2) operating the belt at as high a rate of speed as practical and (3) reversing the belt whenever a definite camber develops. Copies of the material may be obtained by writing direct to: Cambridge Wire Cloth Co., Cambridge, Md.

Suspended Doors Speed Openhearth Repairs

In an openhearth furnace the failure of the front walls, especially the door jambs, can be most exasperating to the operators. This is especially true if it occurs during a campaign. Frequently, the failure is caused by the more rapid erosion of the lower refractories.

When the erosion is deep enough, the upper unsupported walls collapse. Many times, this means an entire rebuild.

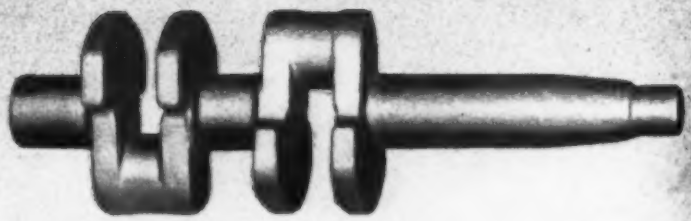
Hot Furnace Problem—Repairing these walls can be extremely unpleasant to the masons. This is especially true when the repairs must be made without allowing the furnace to cool.

Since Geo. P. Reintjes Co., Pittsburgh, began devoting its efforts to designing suspended basic refractory walls and arches for openhearth furnaces, they have been asked many times by steel men, "why not design suspended front walls?"

Due to the many problems in-

How often do you find a flaw in a coin?

...or in a FORGING?



(Both are made by the same basic process)

When closed impression dies strike a coin, or hammer out a forging, they produce a result that gives specific advantages — **freedom from concealed flaws, closeness to tolerance, strength without bulk, superior resistance to impact and fatigue stresses.** These advantages mean fewer part rejects, greater overall economy, better product dependability and performance. These advantages are all found in forgings, **the metal you can trust.**

Do you have a part design problem? Are you now purchasing parts, made by other processes, which require extra metal to provide strength? Are you using weldments, or fabricated assemblies? You will find that often forgings can eliminate extras, and yet give you quality-plus advantages.

Make it a point to call in a forging engineer to learn more about how up-to-date methods and techniques of forging can help to reduce your products or part cost.

Reduce your cost by using forgings. Send for booklets, ☐ "What is a Forging?" and ☐ "Management Guide to the Use of Forgings."

closed-die **forgings** for metal you can trust

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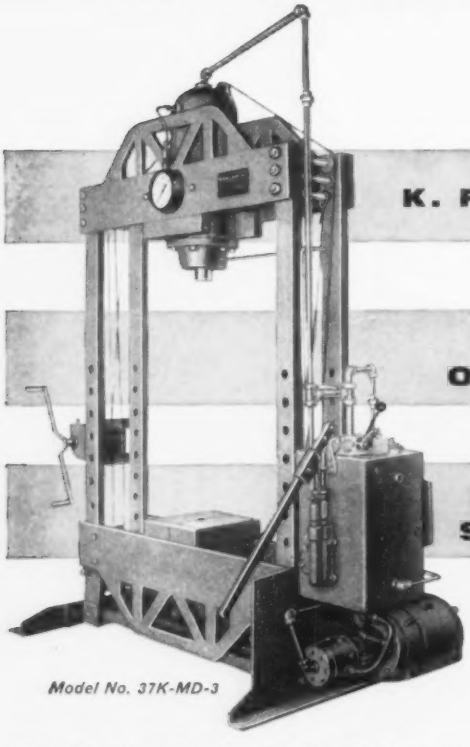

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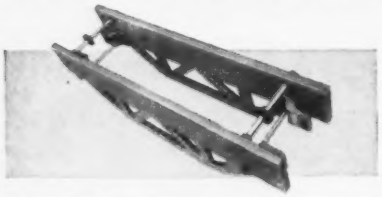

Photo above indicates the heavy construction of bed plates — reinforced to provide maximum rigidity and minimum deflection.

SPECIFICATIONS

Ram Speeds — in./min.	18
Cylinder Bore — in.	7
Ram Stroke — in.	12
Daylight — in./max.	42 1/4
Opening, L-R — in.	45 1/2
Between Bed Plates	11 1/8
Motor, H.P.	7 1/2/220/440-3-60
Shipping Wt. — lbs.	3025

STANDARD EQUIPMENT

1 pair notched V blocks; 1 pressure gauge, dual range P.S.I. and tons on ram; 1 bed adjusting mechanism; 1 flat ram nose; 1 auxiliary 2-speed hand-pump.

You won't have to baby this husky K. R. Wilson hydraulic shop press. Built to tackle the toughest jobs, it's the most rugged standard press of its type available. Heavy-duty, spring-return ram type hydraulic cylinder has a larger bore and longer stroke. This allows the press to handle the big jobs swiftly and safely with a minimum of bed plate adjusting. You get tremendous versatility too! The large, usable daylight opening between side members allows straightening of long pieces. Pressing bushings, shafts, wheels on and off, broaching, bending, coining, forming and drawing operations all can be handled with equal speed and ease. K. R. Wilson Motor Operated Hydraulic Shop Presses are also available in 30, 50 and 75 Ton Capacity. Get all the facts now on these rugged presses!

Get Full Details. Write for Bulletin No. 19

HYDRAULICS DIVISION

K. R .WILSON, Inc.

Offices & Factories – 208 Main St., Arcade, N. Y., U. S. A.

volved, the firm elected to use their externally supported metal encased basic refractory wall and arch constructions. These are similar to those which have proved service-

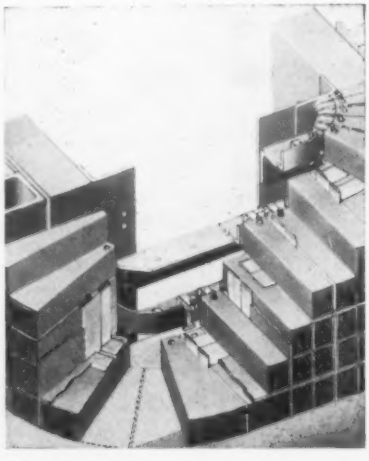

Illustration shows the door jamb extending from hearth upward.

able as externally suspended basic up-take walls in openhearths. Hung vertically, these externally supported tiles effectively eliminate end thrust from the arcuate nosings.

Castings Are Cool—As sloping chill walls, the supporting castings remain from 300° to 500°F cooler than other methods, the company reports. The same externally supported tiles can be used to support an all-basic roof. By a slight modification of these tiles and similar designed castings, they form suspended basic refractory door jambs.

So that each tile can be individually supported from the rear, the corners are rounded. This protects jambs from the charge bucket.

The castings are supported from the vertical leg of formed angles. These angles in turn are supported from the vertical buckstays. To permit the tiles to be more readily demounted, every other course of tile is inverted and hung from the same pintle that supports the tile below.

Campaign Repairs — Near the floor plate where erosion is usually the greatest, the firm recommends

that present methods of building solid walls be used. The suspended portion of the walls above remains intact while repairs take place on the lower portion. When necessary the upper portion of the suspended walls can be repaired at the end of a campaign.

Where erosion is not a severe problem, then the walls can be entirely suspended from the foreplate to the roof.

Fastening Setup Saves On Building Time

A new fastening system for steel buildings cuts construction time and labor costs. The development, an embossed hole fastening system, makes it possible for only one man working on the outside to install roof and wall sheets on steel buildings.

With this setup automatic and uniform location of fastenings is possible. It eliminates slow and costly on-the-job drilling which sometimes results in irregularly spaced holes and poor alignment.

Scaffold Unnecessary—Using the new fastening method, a worker forms an impression on the outside

Installer with mallet strikes a prepunched hole in the roof.

of the wall or roof panel by striking with a mallet over a prepunched extruded hole in the grit or purlin. Once this impression is made, the proper screw location is immediate-

HOW *Cambridge* Woven Wire Belts help Heat Treaters

increase uniformity, speed production

By providing continuous movement through heat treating cycles, woven wire conveyor belts eliminate batch handling, increase product uniformity and production capacity in annealing, brazing, quenching, tempering, sintering, etc. EXAMPLE:

Continuous Annealing

MOVING BELT carries a stream of brass light bulb ferrules through furnace for continuous uniform annealing at 1400° F.

OPEN MESH of Cambridge belt allows free circulation of heat around load so that hot spots are eliminated. Open mesh construction also permits rapid drainage in wet processes such as quenching and washing.

ALL-METAL BELT withstands heat up to 2100°F. (as in copper brazing) without damage, provides lasting strength because there are no seams, lacers or fasteners to break or wear.

SPECIAL RAISED EDGES hold parts on belt, are typical of a variety of side and surface attachments available to hold the product during flat or inclined movement.

Cambridge Woven Wire Conveyor Belts are made in any size, mesh or weave, from any metal or alloy, and can be used under a wide range of conditions . . . hot or cold, wet or dry. Call your Cambridge Field Engineer to discuss how you can cut costs with continuous processing on woven wire conveyor belts. Look for his phone number under "Belting, Mechanical" in the Yellow Pages or write for FREE 130-PAGE REFERENCE MANUAL.

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

The Cambridge Wire Cloth Co.

Department A, Cambridge 3, Maryland

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ly determined without the necessity of awkward scaffold work from the inside.

After finding the screw location, it is a simple matter to punch a hole in the spot marked by the impression in the roof or wall panel. When a sheet metal screw with a neoprene washer is applied, the extruded hole provides a raised area. This fits tight against the washer assuring a weather-tight seal. Ordinary fastening methods require a drift pin that often enlarges the holes in the sheeting. It sometimes makes them too large for washers to cover them adequately, causing eventual leakage.

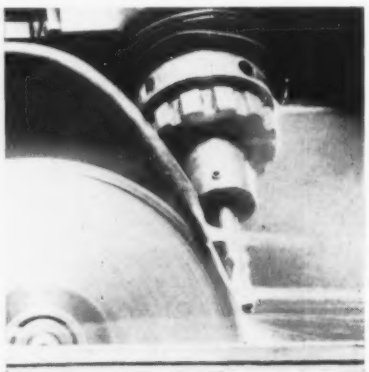
In addition to costs saved through the elimination of inside scaffolding, construction time is also reduced, since the sheeting can be placed and screws applied by one man. The setup is a development of Steelcraft Mfg. Co., Cincinnati.

Electrolytic Process Grinds End Mills

A manufacturer of solid carbide end mills precision grinds tools by a new electrolytic grinding process. The method reportedly reduces grinding heat in the tool production stage by more than 90 pct, eliminating heat-check damage.

Heat stresses to which carbide mills are subjected in some diamond wheel grinding processes just do not exist with this new production method, states its user, Elgin National Watch Co., Elgin, Ill.

How It Works—It removes metal stock by a de-plating or electrochemical action in conjunction with a special diamond wheel. The diamond wheel receives a negative electrical charge while the carbide tool blank is positively charged during stock removal.



Fluted carbide end mill finishes run on electrolytic grinder.

Cutting is accomplished with a special electrolyte, a solution that conducts the electrical current. This feeds to the work with a wax-impregnated coolant. The wheel guides flute etching of the carbide tool blank with little heat generation.

Review Handling Dollar

"How to Get the Most for Your Equipment Dollar," will be discussed at one of the conferences held by the American Material Handling Society on April 30 to May 2 at Philadelphia.

In conjunction with the 7th Annual Materials Handling Exposition, the society will present an analysis of many materials handling topics.

Producer Casts Solid Disk, Cores Sides

An unusual wafer valve disk, weighing 1701 lb, had to be cast in a single piece with the center of each side either cored or kept hollow.

Allegheny Ludlum Steel Corp.'s Buffalo foundry did the job by keeping the mid-portion of the valve solid and coring each side. The metal sections or skins of the valve are ¾-in. thick. They are made of type 304 stainless.

ARMSTRONG T-SLOT CLAMPS

Make rigid set-ups in minutes on planers, drill presses, milling machines or other T-slotted beds or platens. Clamp slides or rotates to position on anchoring T-slot bolt. Drop forged, heat-treated body. Heat-treated screw has V-slotted swivel cap.

Write for Bulletin SUT

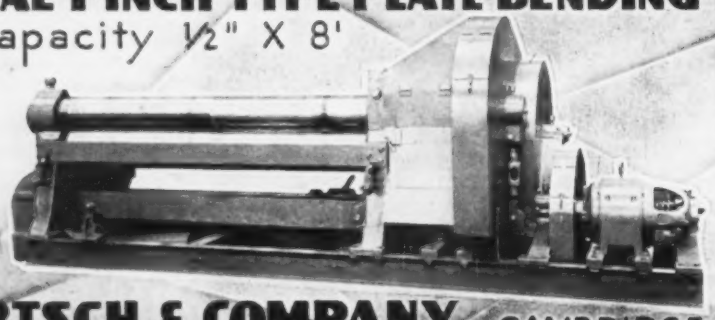
ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
5209 Armstrong Ave., Chicago 30, U.S.A.

"DAVIS" KEYSEATER

Low in Cost. Durable. Easy to operate.
Table adjustable for straight or taper keyways.
Three sizes. Keyways 1/16" up to 1".

DAVIS KEYSEATER CO.
400 Exchange St., Rochester 8, N. Y.

INITIAL PINCH TYPE PLATE BENDING ROLL
Capacity ½" X 8'



Our Line
Light and heavy machinery for all classes of sheet metal, plate and structural work

BERTSCH & COMPANY, CAMBRIDGE CITY · INDIANA

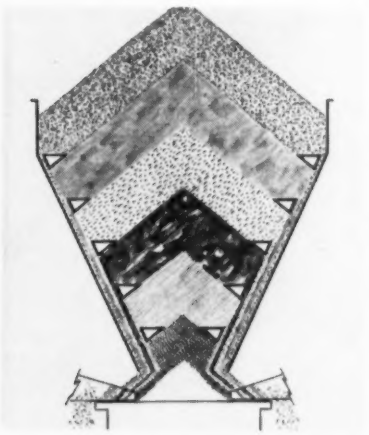
Produced for W. S. Rockwell Co., Fairfield, Conn., the valve is 48 in. in diameter. It is part of a circulating water system through which highly corrosive salt passes.

Grinder operator removes burrs from the 1700 lb casting.

The user specified stainless steel, since corrosion would hinder the valve's tight closure.

Setup Blends Coke Mix For Blast Furnaces

A new setup mixes and blends bulk materials into a uniformly homogeneous mixture in a continuous flow.



Bin empties automatically blended material from its bottom.

Developed by Hewitt - Robins, Inc., Stamford, Conn., the system is expected to be useful in blending coking coal for steel blast furnaces. It can also be used with many other free flowing bulk materials, though.

The blending is done in a metal or concrete bin containing a series of overlapping baffles. These deflect the out-flow to the sides of the container. Material to be blended is layered into the bin by a conventional belt conveyor tripper on top of a rectangular bin or a simple chute in the case of a cylindrical bin. While the bin is being emptied from the bottom the incoming material is directed into the side chute section in a continuous series of small increments from top to bottom.

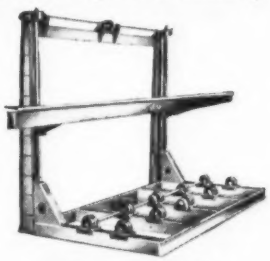
Blending Is Automatic—Blending takes place automatically as small portions of each layer enter the chute area and flow downward by gravity. At the bottom of the bin, the material is removed from the outlet shelf by a plow or similar device and taken away by belt conveyor.

The bin can be built any size, depending on the volume of material to be blended.

WEBB TANK PRODUCTION MACHINERY

The WEBB Corporation is the only manufacturer to offer a complete line of machines and fixtures built exclusively for the tank fabricator. Designed for use with manual, semi-automatic or full automatic welding processes. These machines are built for rugged use, using welded steel construction wherever possible.

In selecting a time-proven product of the Reed Equipment Division, you are buying guaranteed performance and a machine designed to do your work efficiently and economically.



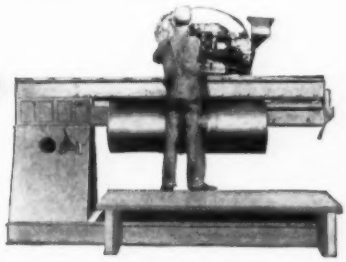
UNIT TYPE ROLL

A complete line of Unit Type Track Supports and Turning Roll Fixtures can be provided for the welding of longitudinal and girth seams of cylindrical vessels, to 12' in diameter and weighing up to 9 tons.

The unit is of all steel construction and all critical surfaces are machined to insure accuracy.

These fixtures are widely used for single pass automatic longitudinal seam welding, using closed butt joints. This is designed primarily for cylindrical shapes and will also handle flat work and conical shapes. The material is clamped firmly in the jig in contact with the water cooled back up bar.

Machine is of all steel construction.



SEAM WELDER

Horn Type Fixtures | Cylinder Flange Offsetters | Assembly Fixtures | Unit Type Turning Rolls | Portable Turning Rolls | Automatic Welding Track Supports

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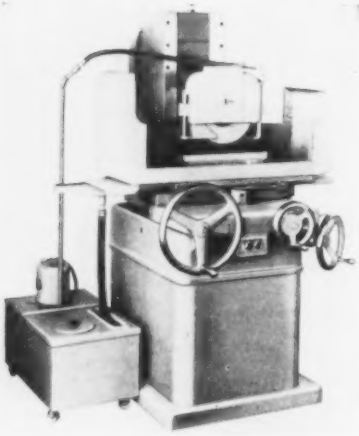
REED EQUIPMENT DIVISION
THE WEBB CORP. WEBB CITY, MO. U. S. A.

New Production Ideas

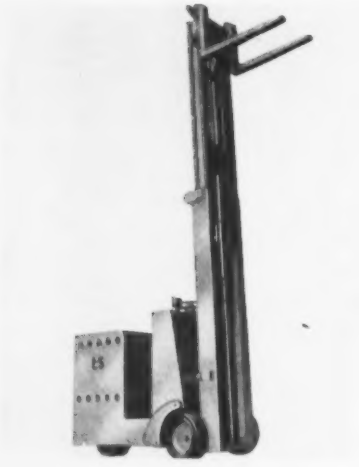
Equipment, Methods and Services



Surface Grinder Features Operator Comfort

Particularly adapted to die block and general tool room work is this hand feed surface grinder. Its elevating handwheel sets conveniently below table level; both the point of wheel contact, and handwheel graduations are thus in simultaneous view of the operator. Hard chrome table ways are available for extra wear resistance, maintaining accuracy, and eliminating periodic rescraping. The hard chrome surface is applied after ways are hand scraped from a master plate. A timing belt drive actuates the table; it eliminates the rack and pinion, a common 2¾ turns of the large diameter handwheel moves the table the full 16-in. The spindle is grease lubricated and sealed. A 2-hp, 1750-rpm motor drives it. Addition of a pump and tank unit can convert the model into an efficient wet grinder. (Covel Mfg. Co.).

For more data circle No. 41 on postcard, p. 105



Fork Lift Trucks Stubbornly Resist Dusts

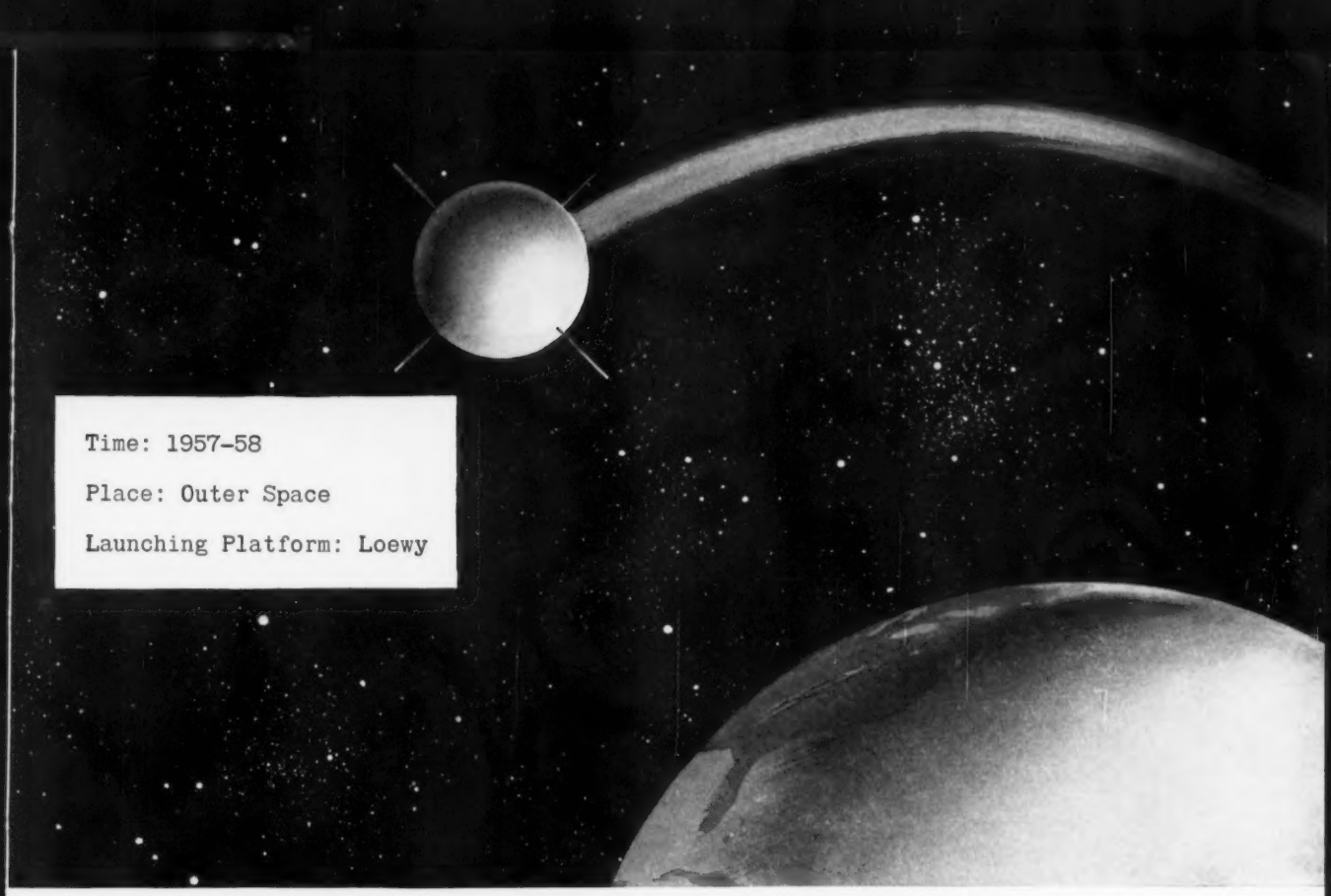
Dust-resistant fork lift trucks stubbornly resist invasion by metal, coal or coke dusts, as well as carbon black. The electrically powered materials handlers have their traction and pump motors totally enclosed. These also have special, extra-wide, wrap-around brush covers and cork neoprene gaskets to provide tight sealing. For protective purposes, the starting and first speed resistors mount in a tightly gasketed compartment, welded integrally with the main control department. Connections between the two compartments pass directly through the separating wall. They do not go outside the enclosure. A 16-gage sheet steel housing with a tight-fitting gasketed flanged cover encloses the main contractors and timing device. Conductors for the main power circuit are neoprene insulated. The dust-resistant handlers come in "walkie" and riding-type trucks, both high and low lift models. (Lewis Shepard Products, Inc.).

For more data circle No. 42 on postcard, p. 105

Welder Switches to Powerplant or Pipe Thawer

This gasoline engine driven welder-powerplant uses a 12.9-hp engine. It produces a full 22-amp of continuous rated, high cycle welding current or 5-kw of 110/-220 ac. The power can operate power tools, lights, etc. One kw of 110-v dc is available while welding. Featuring weather-proof ruggedness, the unit is highly portable. It instantly changes over from welder to powerplant to pipe thawer as needed. The new models feature shielded mufflers and a large gas tank. These are needed to match the high power output rate. Optional equipment also includes rubber-tired hand running gear or road towing trailers for even better portability. (Miller Electric Mfg. Co., Inc.).

For more data circle No. 43 on postcard, p. 105



AROUND THE WORLD IN 90 MINUTES. Artist's conception of the first man-made satellite, which will circle the earth in 90 minutes as it hurtles through space 300 miles from us at a speed of more than 18,000 miles an hour.

Artist's conception of Vanguard rocket carrying earth's first man-made satellite as it is being launched.

Loewy-Hydropress builds earth satellite launching platform

Under Project Vanguard, the launching structure for the earth's first man-made satellite has been designed, built and installed by Loewy-Hydropress. This platform will be used for both testing and firing the huge 3-stage rocket and will measure its weight and pull during static firings. Loewy-Hydropress, under its subcontract with The Martin Company, Baltimore, prime contractor for the rocket, is in charge of complete stand instrumentation and support stand mechanisms, as well as of utilities and preliminary research, such as heat stress analysis.

The same talents that have successfully met the challenge of Vanguard are solving unprecedented problems in the Fleet Ballistics Missile Program, the Intercontinental Ballistics Program, and other major tactical missile operations. Also making a vital contribution to Project Vanguard is the Electronics and Instrumentation Division of Baldwin-Lima-Hamilton.

Loewy-Hydropress experience in missile launching systems, together with its engineering and complete fabricating facilities, is at your disposal. Take advantage of Loewy's exceptional background and wide range of creative skills. Write us today, Dept. A-3, for full information.

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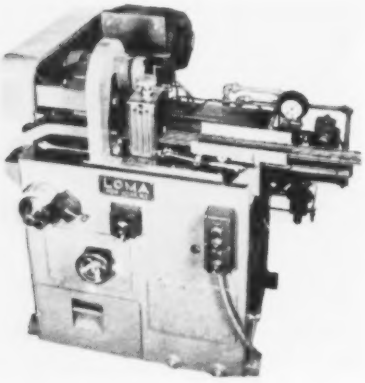
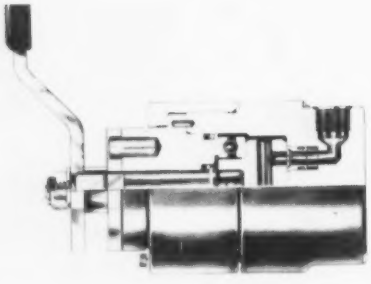


Saw Cuts-To-Length Nonferrous Tubes, Rods

Designed to maintain close tolerances, a high-production circular cutoff saw cuts-to-length nonferrous tubes and rods. The machine handles a range of sizes from less then ¼ to 4-in. diam. Outstanding feature of the new saw is its swinging arm design. This causes an oscillating movement of the sawblade. The resulting cutting action aids multiple strand sawing considerably. As many as ten tubes or rods can be cut simultaneously on the setup. An up-an-down movement of the saw is effected by a combination oil-air system of cylinders. During the feed stroke, oil forces out of the hydraulic cylinder, at a rate carefully controlled by a steplessly adjustable flow control valve. In this manner, the desired feed rate can be selected. (Loma Machine Mfg. Co., Inc.).

For more data circle No. 44 on postcard, p. 105



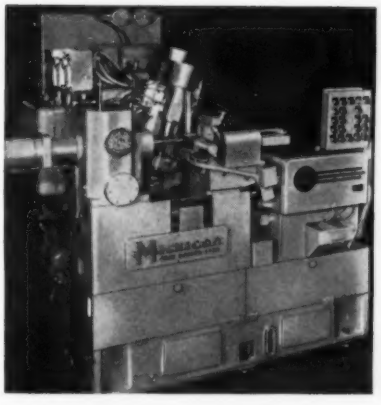
Shutoff Valve Withstands Surges of 15,000 psi

Rated for liquid or gases of 10,000-psi, this new shutoff valve withstands surges up to 15,000 psi without damage to the valve. It has a burst pressure of 40,000-psi. The unit utilizes a method, called the Shear-Seal principle, used on older models. These included special high pressure valves and standard ones of up to 6000 psi. The new valves can be furnished for pipe, tube and 150 or any preferred special high pressure connection, according to the manufacturer. (Barksdale Valves).

For more data circle No. 45 on postcard, p. 105

"Buff"de Gook Comes Clean
The plate always streaks and bubbles in this deep groove. We're not getting all the buffing compound out, even tho we dumped the electrocleaner just yesterday
And only 5 ounces a gallon at 160°? We'll give it a whirl . . . Say, Al, how'd you learn so much about plating?
"To work for Pennsalt, I had to learn not only your problems but the problems of the drawing shop, the paint shop, the porcelain enamel boys, the aluminum fabricators — everybody who uses chemicals on metal."

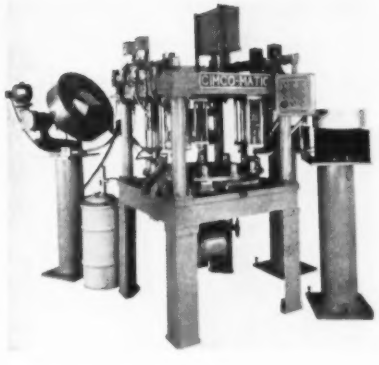
Hobber Uses Common Base for Easy Tandem Setup



Using a common sub-base, new high speed gear hobbers can be set up in tandem or unlimited series with automatic through-feeding and removal of parts. Gear washers and gear classifiers easily intrigate into the machine units. They also feature automatic size control. All machine services are self-contained in the sub-base. These include: (1) air or hydraulic pressure lines for operation of feeds, (2) a self-contained coolant system or coolant piping for addition to the central system, (3) a chip removal conveyor, (4) used-coolant return lines, (5) conveyor lines to remove finished parts, and (6) central system lubrication lines. The master panel and electrical connections mount in the sub base, so that the hobbing unit can be taken out without affecting "in line" gear production. (Michigan Tool Co.).

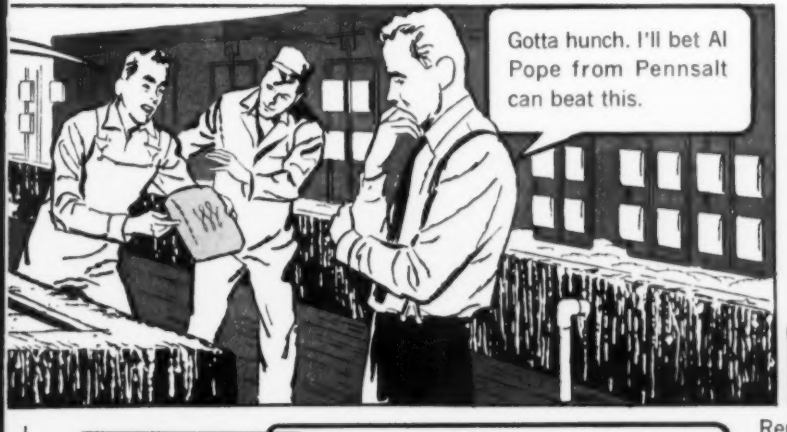
For more data circle No. 46 on postcard, p. 105

Machine Assembles Auto Horns at Rapid Rate



Open, simplified design is a feature of a new line of special assembly machines. This permits ready accessibility for operation and retooling. The machine shown has 12 stations. Its job is to assemble upper horn bearing units for a 1957 model automobile. Using a 12-station index table, the setup has a special 36-in. dial plate and pneumatic operated work stations. Its electrical system is built to JIC standards. The machine produces 900 complete assemblies per hour with one operator. All work stations are around standard tooling support units suspended from the top plate. This readily permits machine modification for minor part changes. (Cimco Engineering Co.).

For more data circle No. 47 on postcard, p. 105



I think we can get these shells perfectly clean . . . and save you money besides, by letting you run your tanks cooler. I'll check our Whitemarsh lab.
OK, but hurry, Al.

Two Weeks Later...
Al, your service is as good as your products. We weren't getting anywhere with that buffing gook till I let Pennsalt work on it.

Remember—nobody knows more about metal processing chemistry than Pennsalt. Even if your trouble may not seem to involve your Pennsalt salesman, call him in anyway. Or write

Pennsalt Chemicals

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Pennsalt Chemicals
3 Penn Center
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Please send me information on Pennsalt
☐ metal cleaners ☐ phosphate coatings
☐ cold-working lubricants.

Name_____
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City_____ Zone____ State____

Shorten load handling time with a READING CRANE!

● One well-known stove manufacturer wanted to speed-up assembly—a call to Reading Engineers led to complete solution. A 10-ton, double I-Beam, cab-controlled Reading Crane brought even better results than expected.

Get complete information from our latest 16-page bulletin "The Why and How of Faster Production". Write today.

READING CRANE & HOIST CORP.

CHAIN HOISTS • OVERHEAD TRAVELING CRANES • ELECTRIC HOISTS

2101 ADAMS ST., READING, PA.

NEW EQUIPMENT

Index Table Boosts Broaching Unit's Output

One manufacturer's ram presses for surface broaching can now be equipped with an indexing table. The automatic table uses a 180° index. It is manually fed and automatically unloaded. Its main features are: self-locking of the fixture by the indexing action, precision alignment, and high performance with complete safety. Set up for a manufacturer of automotive hardware, the new machine with built-in index broaches 1200 rocker arm assemblies an hour. It loads these pieces two at a time, automatically clamps them, double broaches them in one pass and automatically ejects the parts. Cycle time, at 100-pct efficiency, is six seconds. The machine is a 4-ton capacity, 24-in. stroke model. Other models are rated at 6 and 10 tons. The addition of the new indexing table increases their versatility. (Colonial Broach & Machine Co.).

For more data circle No. 48 on postcard, p. 105

Blackness Hides Tape

Black cotton cloth electrical tape makes taping inconspicuous, avoids the "bandaged" look that accompanies the use of light colored tape. The material applies as a pressure sensitive tape in its uncured state, or it can be subjected to care through heat which firms the adhesive and gives it solvent resistance. (Permacel Tape Corp.).

For more data circle No. 49 on postcard, p. 105

Chamfers Hidden Holes

A special two-station machine performs functional chamfering of hidden holes. Workholding fixtures, are of necessity, custom-tailored, but the machining concept of the unit is felt applicable to many uses. As set up for one manufacturer, the new machine countersinks 20 blind holes on an internal diameter of a workpiece. The machine semi-automatically positions parts on the work spindle. Then, it manually clamps them. Central and radial locations of the workpiece is taken from pre-drilled holes. The rotary burr tool, mounted on a slender but sturdy shaft, comes into contact at 90° to the work. The piece is automatically indexed for the complete cycle. (Modern Industrial Engineering Co.).

For more data circle No. 50 on postcard, p. 105

Hendrick Manufacturing Company, pioneer perforator, can really help designers improve product appearance and salability SOLD. No matter what the material you're using... be it metal, masonite, rubber, plastic, or insulated board, Hendrick's wide experience and manufacturing facilities can be of real help. You can select from hundreds of attractive designs in commercially rolled metals and gauges in round, square, diamond, hexagonal, or slotted, square-ound, perforation in plain or Panel effects.

Hendrick MANUFACTURING COMPANY

37 Dundaff Street, Carbondale, Pa.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring — Shur-Site Treads • Armorgrids • Hydro Dehazers • Petrochemical Column Internals

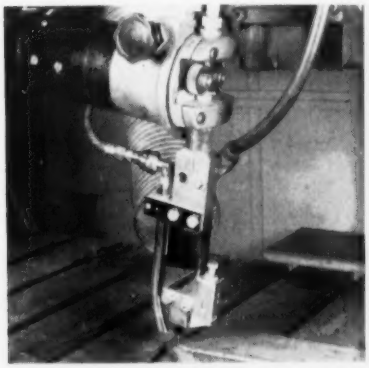
Microhoning Is Standardized, Compact

Of standardized design, this microhoning machine is a compact unit. Recommended for use by small firms, the microhoner is actually a basic unit. Its users can add packaged automation equipment to it at will. Built as a horizontal type unit with a stationary bridge to accommodate work fixtures and optional equipment, this design facilitates addition of automatic work handling devices. It also simplifies changeovers from one job setup to another. The spindle mounts on a reciprocating carriage, hydraulically actuated, while the adjusting head operates manually. The base is one cast piece; this assures rigidity. The machine is 34 wide x 52-in. long. It has a 12-in. stroke and a 1½-in. work diameter capacity. Partial or full automation may be given it. (Micromatic Hone Corp.).

For more data circle No. 51 on postcard, p. 105

Torch Welds in CO_2

A dry-type torch performs automatic Fillerarc welding in a carbon dioxide atmosphere. Interchangeable with the standard water-cooled version in its attachment to an automatic wire feeder, the new unit operates up to 800 amp. Its inverted pyramid tip design deflects spatter and reduces the possibility of spatter build up. The torch has no hose connections necessary for operation of water-cooled torches. It comes with tips which can handle wire from 0.045 to ⅛ in. and can be used with an adapter for mounting separate from the wire feeder. (Welding Dept., General Electric Co.).



For more data circle No. 52 on postcard, p. 105

Tapper Drills, Reams

Tapping combines with drilling and reaming in this four-post machine previously designed for the latter operations only. The drill head with its contingent fixturing is removed to accommodate a lead screw

the NEW miller MULTI ARC
combination ac-dc welder

The Miller Multi-Arc combination ac-dc welder, built specifically for metallic arc welding, delivers either ac or dc current at the flick of a switch. Electrical control circuit eliminates mechanical controls. Primary switch is standard equipment; Power Factor Correction optional. Six models from 10 to 525 amperes—all with 60% duty cycle ratings.

Complete specifications sent on request.

". . . if it's Miller you know it's the finest . . ."

miller Electric Manufacturing Company, Inc.
APPLETON, WISCONSIN
distributed in Canada by CANADIAN LIQUID AIR CO., LTD., Montreal

There's a **Ruthman GUSHER** Coolant Pump to fit every requirement

IMMERSED TYPE

Available in 1/10 to 5 HP in either long or short models with separate tank units if desired.

Model 6-P3

PIPE CONNECTED TYPE

Available in ¼ to 5 HP. Easy to install—provides long trouble-free operation.

Model Y-LO

FLANGE MOUNTED (External Discharge)

Available in 1/10 to 5 HP, long or short models. Simple, sturdy design with fewer parts to wear.

Model 11022

FLANGE MOUNTED (Internal Discharge)

Availdble in 1/10 to 5 HP long or short models. Can be easily and quickly installed in most convenient place.

Model 11027

SHAFT & PULLEY DRIVEN

Gusher Coolant Pumps are also available for installation with shaft coupling or pulley drive, these pumps are supplied without electric motors.

THE **RUTHMAN** MACHINERY CO.

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1809-1823 Reading Rd. Cincinnati, O.

NON-FLUID OIL

TRADE MARK REGISTERED

For Cleaner, Cooler-Running Electric Motors

Besides keeping motors cooler, without the messy slinging and dripping of ordinary lubricants, NON-FLUID OIL lasts longer—providing better lubrication at less cost per month. Furthermore, it avoids the bother and expense of burn-outs and shorts caused by oil-soaked insulation.

NON-FLUID OIL *stays alive longer* than regular greases, retaining its high lubricating properties until entirely used up . . . outlasts ordinary lubricants 3 to 5 times, without drying out or hardening.

Try NON-FLUID OIL in your own equipment. Free sample and Bulletin 504 on request (specify application).

NEW YORK & NEW JERSEY LUBRICANT COMPANY

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WORKS: NEWARK, N. J.

1896 61 1957 YEARS OF LUBRICATION SERVICE NON-FLUID OIL TO INDUSTRY

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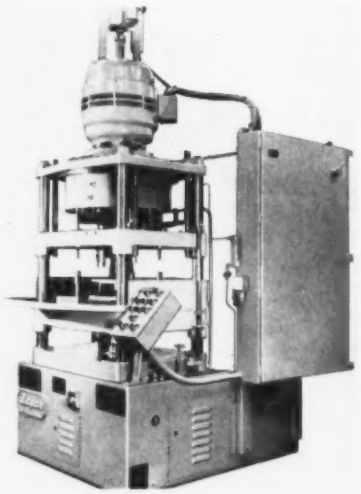
Columbus, Ga.	Springfield, Mass.	Providence, R. I.
Charlotte, N. C.		St. Louis, Mo.

NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture.

tapping head. Small production runs with changeable hole patterns, as well as various operations, can be economically tooled. The four-post principle involves a hydraulically actuated ram which raises the work and feeds it into the rotating spin-

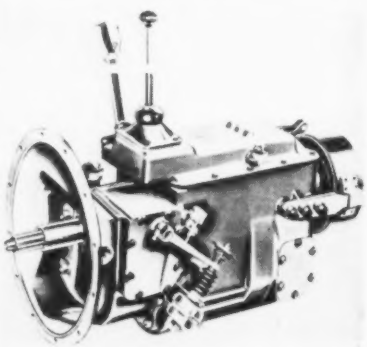


dles of the head. All holes are machined simultaneously. The design lends great rigidity to machine operation and affords long drill life. Holes as close as the sum of the hole diameters can be drilled or tapped. (Zagar, Inc.).

For more data circle No. 53 on postcard, p. 105

Reduces Gear Shifting

A new semi-automatic heavy duty truck transmission minimizes shift lever and clutch pedal manip-



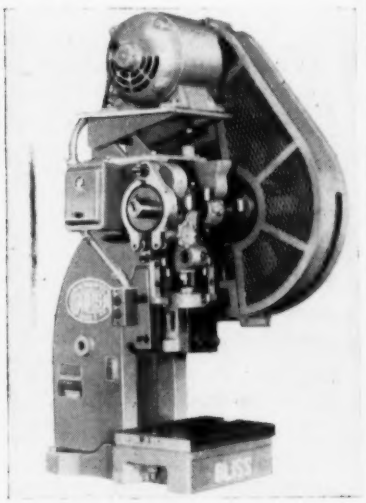
ulation and reduces the need for skilled gear shifting. It is an integrated combination of a five-

speed synchronized transmission and an auxiliary gear train. The auxiliary unit is composed of a direct and an underdrive gear set. These are semi-automatically engaged. The underdrive gear ratio "splits" the geared steps of the transmission. As a result, the unit has ten closely spaced gear ratios. (Clark Equipment Co.).

For more data circle No. 54 on postcard, p. 105

Press Has Long Slide

A new line of bench presses includes a 4-ton adjustable bed and horning press, 4- and 7-ton inclinable presses and a 10-ton fixed bed press. Many design features of

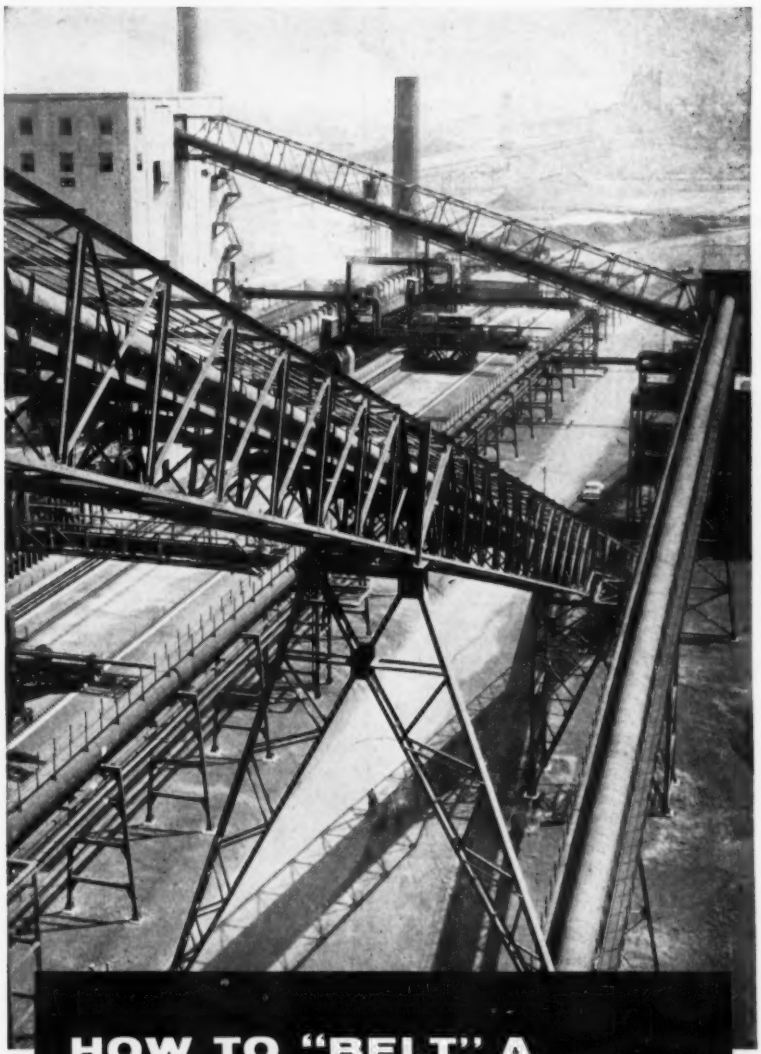


standard-sized presses are incorporated in these new bench presses. The new line features, for example, an extra long slide, renewable ball seats and bronze ball cap bushings, cast Meehanite frames, split-bronze bearings, and extra-long, removable V-type gibbing. In addition, the presses can be equipped with a rolling key clutch, the type now in use on inclinables, or an air friction clutch. (E. W. Bliss Co.).

For more data circle No. 55 on postcard, p. 105

Dock Boards Are Light

Magnesium dock boards for concrete docks solve some problems involved in the installation of permanent-type dock levelers. The dock boards self adjust to truck or trailer floor levels automatically. They feature low set-back allowing high



HOW TO "BELT" A PRODUCTION PROBLEM

To handle coking coal and coke at its Fairless Works, United States Steel had Hewitt-Robins design a bulk materials handling and processing system. Coal conveyors and preparatory equipment have a rated capacity of 700 TPH. The coke handling and screening unit has a capacity of 200 TPH.

The entire installation, including 18 belt conveyors, 2 belt feeders, a belt and bucket elevator, car puller, grizzly crusher, 2 Gyrex screens, and other machinery, was designed, manufactured and installed by Hewitt-Robins. To find out how H-R products and services can help you, consult your classified telephone directory for the nearest H-R representative, or contact Hewitt-Robins, Stamford, Connecticut.

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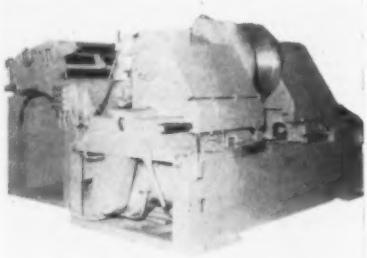
NEW EQUIPMENT

usable dock space. The units swing up and out of the way when not in use. Made of magnesium for lightness and ease of handling, they can be quickly raised or lowered. Optional equipment includes electric-hydraulic system for fully automatic operation. (Magline Inc.).

For more data circle No. 56 on postcard, p. 105

Cradle Handles Coils

This cone-type cradle straightener handles coils from 10 to 60-in. wide x 66-in. maximum OD. It features a cylinder arrangement for roll loading and a lift cylinder to center coils



to cones. The straightener on this machine has five rolls and two sets of pinch rolls. These units handle 20,000 to 50,000-lb and up to 90-in. wide coils, when necessary. (Automatic Feed Co.).

For more data circle No. 57 on postcard, p. 105

Bomb Sprays Parting

Liquid parting for foundry use now comes in 12-oz self-spraying aerosol containers. A light, even coating of the product sprayed over a surface of match-plates or patterns lasts and serves as a parting agent for 20 to 60 molds. (Frederic B. Stevens, Inc.).

For more data circle No. 58 on postcard, p. 105

Setup Measures Oxygen

A new supersensitive indicator measures as little as two parts per million of oxygen in hydrogen or inert gases despite the presence of up to 3-pct carbon monoxide. (Baker & Co.).

For more data circle No. 59 on postcard, p. 105

CHILE	COLOMBIA	PERU	ARGENTINA
SPAIN	PORTUGAL	SO. AFRICA	SWEDEN
ISRAEL	JAPAN	BELGIUM	MEXICO
INDIA	AUSTRIA	BRAZIL	CANADA
ITALY	GERMANY	URUGUAY	ENGLAND
DENMARK	FINLAND	FRANCE	U.S.A.

24 NATIONS UNITED...
on Choice of Yoder Mills for Pipe and Tube Manufacture

It all started less than two decades ago with the introduction by Yoder—and the rapid adoption by American industry—of a revolutionary new type of mills for cold forming and electric-resistance welding of pipe and tubing. England, France, Italy, Mexico, Argentina, and Brazil soon followed the U.S.A. in adopting these mills. Other countries boasting any kind of modern metal working industry did likewise, even including distant Japan, India and South Africa. Production, depending on requirements, varies from 25,000 up to 75,000 feet per 8-hour shift.

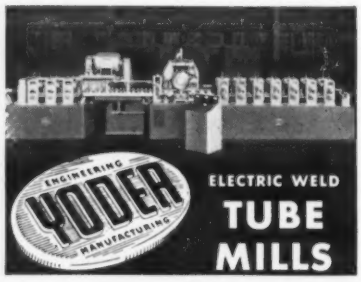
•

By this time, England, Italy and Argentina each have a total of ten Yoder mills in operation; Brazil, eight; Mexico, six; France, five; other nations somewhat in proportion to their population. In many nations, Yoder mills now supply from 50% to 90% of all welded tubes used. Several oustanding production records have been scored by operators in foreign countries, most recently in Italy. Reasons: the simplicity of design, ease of operation and dependability of Yoder mills. Secondly, generous assistance rendered by Yoder in training operators everywhere.

•

Through technological advances, Yoder leadership in tube mill design has been jealously maintained and strengthened from year to year. Ask for literature giving details of the latest improvements. Correspondence invited.

THE YODER COMPANY
5510 Walworth Ave. • Cleveland 2, Ohio, U.S.A.



The Iron Age Summary

Orders Brighten Steel Outlook

Pickup in order volume noticed in last several weeks. Backlog dip halted.

Emergency orders indicate some users have cut their inventories too thin.

■ The steel market outlook is brighter this week. Order volume has picked up. The turn for the better probably will be reflected in May shipments.

Behind the shift: A pickup in plate, structural, and pipe bookings has partially offset the dip in sheet and strip demand.

Reason For Hope—As a result, the downtrend in steel order backlogs has been halted—at least temporarily. Mills are hopeful that a pickup in automotive and appliance sales will reverse the soft tone of recent weeks and spur steel users to protective ordering.

Another hopeful note is the indication from time-to-time that some consumers have cut their inventories too thin. Spot orders for emergency shipments of sheet, strip—even bars—is the tipoff.

Little Price Hedging—An IRON AGE survey indicates that the present emphasis on inventory reduction, largely in flat-rolled, may come to a halt early in May. There are two reasons for this: (1) some consumer inventories will be down to a bare minimum, and (2) there could be a flurry of price hedging among users whose inventories have leveled off. But hedging this year will be nothing like past years when the possibility of a strike was an added incentive.

Oddly enough, some analysts insist that overall steel inventories continue to rise. They look for a leveling off, followed by a downturn, about mid-year. This apparent contradiction is due to the fact that overall steel shipments are running ahead of estimated consumption. And this is largely because of continuing strong demand for the so-called heavy steel shapes.

A Look Ahead — A prediction: While operations will slip gradually toward the 90-mark over the next several weeks, IRON AGE's previous prediction of a 95-96 pct operating rate during first quarter will be substantiated.

As for the second quarter, the relatively sharp dip in the early weeks will be offset by counter-seasonal influences during the latter part of May and most of June. Second quarter operating rate will average close to 90 pct.

The iron and steel scrap market injected a pessimistic note into the picture. Prices declined again this week in virtually all important scrap-consuming areas. Since the end of the year, The IRON AGE Scrap Composite price has dropped more than $15 per ton.

Steel Output, Operating Rates

Production	This Week	Week Ago	Month Ago	Year Ago
(Net tons, 000 omitted)	5,293	5,293	2,848	2,449
Ingot Index				
(1947-1949=100)	149.8	149.8	154.6	154.5
Operating Rates				
Chicago	90.0	91.0*	95.0	99.5
Pittsburgh	95.0	99.0*	101.0	102.0
Philadelphia	104.0	103.5	105.0	105.0
Valley	90.0	92.0*	98.0	92.0
West	101.0	102.5*	101.5	101.0
Buffalo	95.0	95.0	105.0	105.0
Cleveland	91.0	87.0*	96.0	105.0
Detroit	94.0	95.0	106.0	103.0
S. Ohio River	85.0	80.0*	90.0	88.0
South	99.0	95.5	95.5	86.0
Upper Ohio R.	98.0	95.0*	104.0	102.0
St. Louis	102.0	91.0	80.0	100.0
Northeast	66.0	66.0	76.0	90.0
Aggregate	94.0	94.0	97.0	99.5

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.670	5.670	5.661	5.179
Pig Iron (Gross Ton)	$64.56	$64.56*	$62.90	$59.09
Scrap, No. 1 hvy (Gross ton)	$48.17	$49.50	$53.33	$50.17
Nonferrous				
Aluminum ingot	27.10	27.10	27.10	24.40
Copper electrolytic	32.00	32.00	32.00	46.00
Lead, St. Louis	15.80	15.80	15.80	15.80
Magnesium ingot	36.00	36.00	36.00	33.25
Nickel, electrolytic	74.00	74.00	74.00	64.50
Tin, Straits, N. Y.	99.50	99.125*	100.50	100.50
Zinc, E. St. Louis	13.50	13.50	13.50	13.50

STEEL PRODUCT MARKETS

Record Sheet Stocks In Warehouses

Supplies at all-time high as consumers continue to live off their inventories.

Market slackness also influences mills in cutting back some openhearth operations.

▪ The flat-rolled market still lacks a needed shot in the arm.

Warehouses, as a result, are suffering from an inventory glut. Some report an all-time high in sheet stocks with a four or five months' supply on hand. They also complain that a few mills are selling prime stock as reject material in an effort to unload it.

This slackness in sheet probably influenced, to a degree, the recent cutback in openhearth operations. A substantial number of producers including U. S. Steel, Great Lakes, Sharon, Wisconsin and Youngstown Sheet and Tube shut down some openhearths in the midwest last week. However, the oxygen strike, labor problems, and maintenance requirements were also factors in this move.

Tight Belts—Clearly sheet consumers are living off their inventories. And much the same condition exists in bar. One large bar producer, to eliminate gaps in rolling schedules, is reported handling May tonnages now.

There's evidence that in some cases users have pared stocks beyond the bone. Mills and warehouses are getting a fair trickle of "rush-rush" orders from consumers in urgent need of product. These emergency orders, usually for a few hundred ton, are helping to fatten up slim April order books. And looking beyond April, the producers see supply-starved consumers coming actively into the market with orders for May and June delivery.

Price Changes—Bethlehem Steel and Republic have followed U. S. Steel in increasing prices of tinmill products 35¢ per base box, effective April 30. Bethlehem has revised prices upward on merchant wire, annealed and galvanized, at Johnstown and Sparrows Pt. (p. 157).

Sheet and Strip—Gloom continues to surround the flat-rolled market. At **Pittsburgh** ordering of cold-rolled for May delivery sheet is not stacking up any better than April's and that was the worst month so far. Sheet users in the area say they are being pushed by the mills to advance shipping dates.

A warehouse glut in sheet is also present at **Philadelphia.** One distributor has a four-month inventory; another a five-month supply.

Some producers in the Chicago area also have April tonnage for sale. Generally hot-rolled schedules are filling a little faster than cold-rolled. There's some variation between mills. While most of them are current in deliveries and looking for business, another has a 30-day carryover in hot-rolled sheet.

Lack of ordering in **Detroit** area reflects that buyers are living off their inventories. Some rush calls for tonnage indicate that holes in their stocks are beginning to show up. West Coast steel users report fall off in eastern market is enabling them to get increased supplies of strip mill products.

Bar—Chicago mills are looking for a hot-rolled bar pickup in April, but the cold finishers don't share their optimism. Currently some mills have hot-rolled for April delivery. And cold finished can be obtained right from producers' stocks for immediate delivery.

At **Pittsburgh** alloy bars are available for delivery in 3 to 6 weeks. One mill is reported to have moved May tonnages up into March in order to fill gaps left by cancellations.

Only on the larger sizes of bar is demand strong in the **Philadelphia** area. Mills are still peddling April tonnages of hot-rolled.

Bar demand is sluggish at **Detroit.** Lack of customer interest and increased supply from producers turning their backs on flat-rolled production are given as the causes. However, **West Coast** mills are going at breakneck speed to turn out every possible ton of bar they can.

Shapes and Plates—Except for light, small types, plates and structurals are as tight as ever at **Pittsburgh.** Alloy plate is in particularly strong demand for pressure vessel applications.

Easing of the light plate market at **Philadelphia** is seen in the fact that, for the first time, one producer is having to search for buyers of "prime acquisitions."

Shipments of light plate from the east have helped the **Chicago** market for that product. What's more, with local strip mills rolling light plate, buyers don't feel in any hurry to fill up their inventories. However, wide flange beams seem to be out of sight for remainder of the year, also heavy structurals.

PURCHASING AGENT'S CHECKLIST

Are steel users hedging against higher steel prices? **P. 59**

Greater supply of nickel will be available in next few years. **P. 61**

Steel founders are feeling inventory cuts by their customers. **P. 65**

COMPARISON OF PRICES

(Effective March 19, 1957)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	Mar. 19 1957	Mar. 12 1957	Feb. 19 1957	Mar. 20 1956
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.675¢	4.675¢	4.675¢	4.325¢
Cold-rolled sheets	5.75	5.75	5.75	5.325
Galvanized sheets (10 ga.)	6.30	6.30	6.30	5.85
Hot-rolled strip	4.675	4.675	4.675	4.325
Cold-rolled strip	6.870	6.870	6.870	6.28
Plate	4.87	4.87	4.87	4.62
Plates, wrought iron	10.40	10.40	10.40	10.40
Stainl's C-R strip (No. 302)	50.00	50.00	50.00	44.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$9.95	$9.95	$9.95	$9.05
Tin plates, electro (0.50 lb.)	8.65	8.65	8.65	7.75
Special coated mfg. ternes	9.20	9.20	9.20	7.85
Bars and Shapes: (per pound)				
Merchant bars	5.075¢	5.075¢	5.075¢	4.65¢
Cold finished bars	6.85	6.85	6.85	5.90
Alloy bars	6.125	6.125	6.125	5.65
Structural shapes	5.00	5.00	5.00	4.60
Stainless bars (No. 302)	43.25	43.25	43.25	38.25
Wrought iron bars	11.50	11.50	11.50	11.50
Wire: (per pound)				
Bright wire	7.20¢	7.20¢	7.20¢	6.60¢*
Rails: (per 100 lb.)				
Heavy rails	$5.275	$5.275	$5.075	$4.725
Light rails	6.25	6.25	6.00	5.65
Semifinished Steel: (per net ton)				
Rerolling billets	$74.00	$74.00	$74.00	$68.50
Slabs, rerolling	74.00	74.00	74.00	68.50
Forging billets	91.50	91.50	91.50	84.50
Alloy blooms, billets, slabs	107.00	107.00	107.00	96.00
Wire Rod and Skelp: (per pound)				
Wire rods	5.80¢	5.80¢	5.80¢	5.025¢
Skelp	4.225	4.225	4.225	4.225
Finished Steel Composite: (per pound)				
Base price	5.670¢	5.670¢	5.661¢	5.179¢*

	Mar. 19 1957	Mar. 12 1957	Feb. 19 1957	Mar. 20 1956
Pig Iron: (per gross ton)				
Foundry, del'd Phila	$68.88	$68.88	$66.88	$63.69
Foundry, Valley	65.00	65.00	63.00	59.00
Foundry, Southern Cin'ti	67.17	67.17	67.17	62.93
Foundry, Birmingham	59.00	59.00	59.00	55.00
Foundry, Chicago	65.00	65.00	63.00	59.00
Basic, del'd Philadelphia	68.38	68.38	66.38	62.77
Basic, Valley furnace	64.50	64.50	62.50	58.50
Malleable, Chicago	65.00	65.00	63.00	59.00
Malleable, Valley	65.00	65.00	63.00	59.00
Ferromanganese, cents per lb‡ 74 to 76 pct Mn base.	12.75¢	12.75¢	12.75¢	9.50¢
Pig Iron Composite: (per gross ton)				
Pig iron	$64.56	$64.56*	$62.90	$59.09
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	*$59.50*	$50.50	$53.50	$51.50
No. 1 steel, Phila. area	*51.50*	53.50	57.50	50.50
No. 1 steel, Chicago	*53.50*	44.50	49.00	48.50
No. 1 bundles, Detroit	*51.50*	42.50	45.50	44.50
Low phos., Youngstown	*58.50*	50.50	53.50	57.50
No. 1 mach'y cast, Pittsburgh	*54.50*	56.50	56.50	57.50
No. 1 mach'y cast, Philadel'a	*55.50*	57.50	57.50	55.50
No. 1 mach'y cast, Chicago	*58.50*	49.50	50.50	53.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	*$58.17*	$49.50	$53.33	$50.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$14.25
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$16.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	32.00	32.00	32.00	46.00
Copper, Lake, Conn.	32.00	32.00	32.00	43.00
Tin, Straits, New York	99.50†	99.125*	100.50	100.50
Zinc, East St. Louis	13.50	13.50	13.50	13.50
Lead, St. Louis	15.80	15.80	15.80	15.80
Aluminum, virgin ingot	27.10	27.10	27.10	24.40
Nickel, electrolytic	74.00	74.00	74.00	64.50
Magnesium, ingot	36.00	36.00	36.00	33.25
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on P. 156→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	66.50	67.00	67.50	68.00	.....
Birmingham *R3*	58.50	59.00*	.....	.....	.....
Birmingham *W9*	58.50	59.00*	63.00	.....	.....
Birmingham *U4*	58.50	59.00*	63.00	.....	.....
Buffalo *R3*	64.50	65.00	65.50	66.00	.....
Buffalo *H1*	64.50	65.00	65.50	66.00	.....
Buffalo *W6*	64.50	65.00	65.50	66.00	.....
Chester *P2*	66.50	67.00	67.50	.....	.....
Chicago *I4*	64.50	65.00	65.00	65.50	.....
Cleveland *A5*	64.50	65.00	65.00	65.50	69.50†
Cleveland *R3*	64.50	65.00	65.00	65.50	.....
Duluth *I4*	64.50	65.00	65.00	65.50	69.50†
Erie *I4*	64.50	65.00	65.00	65.50	69.50†
Everett *M6*	64.50	65.00	65.50	.....	.....
Fontana *K1*	70.50	71.00	.....	.....	.....
Geneva, Utah *C7*	62.50	63.00	.....	.....	.....
Granite City *G2*	66.40	66.90	67.40	.....	.....
Hubbard *Y1*	.....	.....	65.00	.....	.....
Ironton, Utah *C7*	64.50	65.00	.....	.....	.....
Midland *C11*	64.50	.....	.....	.....	.....
Minnequa *C6*	66.50	67.00	67.50	68.00	.....
Monessen *P6*	64.50	.....	.....	.....	.....
Neville Is. *P4*	64.50	65.00	65.00	65.50	69.50†
N. Tonawanda *T1*	.....	65.00	65.50	66.00	.....
Sharpsville *S3*	64.50	65.00	65.00	65.50	.....
So. Chicago *R3*	64.50	65.00	65.00	.....	.....
Swedeland *A2*	66.50	67.00	67.50	68.00	.....
Toledo *I4*	64.50	65.00	65.00	65.50	.....
Troy, N. Y. *R3*	66.50	67.00	67.50	68.00	72.50
Youngstown *Y1*	.....	.....	65.00	65.50	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. * Add $1.00 for 0.31–0.69 pct phos. † Intermediate low phos. ‡ Add $1.00 for 0.31 to 0.50 pct phos.

Silvery Iron: Buffalo, *H1*, $78.50; Jackson, *J1, I4* (Globe Div.), $77.25; Niagara Falls (15.01–15.50), $99.50; Keokuk (14.01–14.50), $110.00; (15.51–16.00), $105.80. Add $1.25 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 14 pct. Add $1.00 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery 6 pct to 14 pct.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	21.25	22.75	22.25	24.25	—	26.00	38.25	31.00	35.50	—	16.00	27.75	16.25
Slabs, billets	26.00	29.00	27.00	30.25	30.75	32.00	47.50	38.50	44.75	—	20.75	—	21.00
Billets, forging	—	35.00	35.75	36.50	39.50	39.00	59.75	45.25	53.50	30.75	27.25	27.75	27.75
Bars, struct.	40.50	41.25	42.50	43.25	46.25	46.00	70.25	53.25	62.25	36.25	32.50	33.00	33.00
Plates	42.50	43.25	44.50	45.50	48.00	48.75	73.75	57.50	67.00	38.75	33.75	35.50	34.50
Sheets	46.75	47.25	49.25	50.00	—	53.25	78.25	63.00	76.25	46.50	38.75	46.50	39.25
Strip, hot-rolled	34.50	37.50	35.75	39.00	—	42.50	66.50	51.50	61.00	—	29.75	—	30.75
Strip, cold-rolled	43.25	47.25	45.75	50.00	—	53.25	78.25	63.00	76.25	46.50	38.75	46.50	39.25
Wire CF; Rod HR	—	39.25	40.25–40.50	41.00–41.25	44.00	43.75	66.75–67.00	50.50–51.00	59.25–59.50	34.50	31.00	31.50	31.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2, J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*; Philadelphia, *D5*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Harrison, N. J., *D3*, Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1*; New Bedford, Mass. (.25¢ per lb higher), *R6*; Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1, F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*; Ft. Wayne, *I4*; Philadelphia, *D5*; Detroit, *R5*; Gary, *U1*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Philadelphia, *D5*; Vandergrift, Pa., *U1*; Gary, *U1*

Forgings billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*.

Market Bearish As Prices Sag

Only token resistance is in evidence, although trade begins to talk tough.

Export weakness brings further declines in East. But West Coast is strong.

■ The big question in the market: When will lower prices begin to dry up the flow of scrap?

Up to now, dealers have put up only token resistance to steadily declining prices. Mills have been able to buy at lower prices with little opposition.

Talk of holding back scrap is now stronger, but mills are still able to push prices down. In spite of still high steel mill operating rates, the market continues bearish.

Mills Won't Buy—In most markets mills are not buying; imply that prices will have to decline further. A scattering of openhearths and a few blast furnaces are down, contributing to the market weakness.

In some areas, the increase in pig iron prices has bolstered cast prices and strengthened the cast market to some extent.

THE IRON AGE Composite Price continues its decline to $48.17. The drop from $49.50 is based on declines in most major markets.

Pittsburgh — Prices of most grades are off $1 in a quiet Pittsburgh market. Weakness comes from a lack of mill buying. One major consumer bought only bundles this month. Another placed relatively small orders and may wait until April for new buying. All signs point to further declines. The recent order for No. 2 bundles was at $40 or $38, depending on shipping distance. Brokers are reported offering low phos at $54 with no takers.

Chicago — Scrap prices slipped again, with the expectation that fresh mill offers to buy at $2 under last week's prices would hit the market by the end of this week. Scrap tonnages moving on new orders continue small. There is some concern over the amount of scrap in dealer inventories. Dealer stocks continue to be critically low.

Philadelphia—The market continues inactive. One mill bought No. 2 bundles at $3 under last week's level. Mills aren't active and dealers are starting to hold scrap to slow the downtrend. But, on the basis of general weakness, most steelmaking grades are down $2.

New York—Virtually all grades slipped from a combination of piled-up stocks at export docks and few, if any, orders from domestic consumers. Brokers and dealers are anxiously waiting to see how April mill buying shapes up. Meanwhile, there is no guaranteeing prices won't go lower before new buying bolsters the market.

Detroit—Some No. 1 grades dropped another $1 this week as the market continues weak. Blast furnace grades are also off $1. Both brokers and dealers expect the softness to continue as a result of lower operating rates at some mills here.

Cleveland — Cleveland brokers are swallowing $6.50 freight bills to land No. 2 bundles in Pittsburgh at $40. They are forced into this by weakness of local and Valley markets. One local mill made a moderate purchase of No. 2 bundles from restricted yards for $37. Cleveland and Valley markets are down $2 on appraisal.

St. Louis—While a few steel grades are down $1, the market is generally better than in most centers. Offerings of industrial scrap are low and the district must depend on dealer stocks. Dealer inventories and collections have dropped. One mill which withdrew from the market a week ago was back in.

Birmingham — The market in this district is quiet, with the possible exception of export, and even this market is sporadic. There is no buying of openhearth grades and purchases of electric furnace and cast grades are nominal.

Cincinnati—The new pig iron price increase has bolstered cast iron scrap market, but steelmaking grades continued their slow decline another $1. Out of town markets are so depressed, dealers are accumulating their own inventories.

Buffalo—All openhearth grades declined $2 in a weakening market. No. 1 cupola cast is also down $2, with a small sale of this item made at even lower prices. Low phos is down $3, railroad grades $2 and turnings down $1. A strike at a leading consumer still contributes to the market decline.

Boston—The entire list is off. There is no new business following March 15 orders. The domestic market is very quiet and export is practically nil. Declines are based on absence of new orders except small tonnages at new prices.

West Coast—Mills are getting enough to meet their requirements despite a slight slowup in flow of scrap because of weather conditions. Exporting continues brisk. Prices are expected to hold for the rest of the month.

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Scrap is automatically classified for you by your customers when you serve them with The Load Lugger System of detachable steel containers handled by a Load Lugger equipped truck. This enables you to pay higher scrap prices, putting you in a more advantageous competitive position.

The Load Lugger System further reduces costs by eliminating expensive crane pick-ups. One Load Lugger equipped truck, operated by one man, the driver, can render fast, efficient service to a large number of customers.

The use of Load Lugger containers keeps customers premises free of unsightly, hazardous scrap piles — a fact which your customers will appreciate and which further cements customer relations and opens doors to more business for you.

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AFTER: Scrap stored in Load Lugger containers keeps customer premises neat, reduces collection costs.

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SCRAP PRICES *(Effective March 19, 1957)*

Iron and Steel Scrap

Going prices of iron and steel scrap, as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$49.00 to $50.00
No. 2 hvy. melting	43.00 to 44.00
No. 1 dealer bundles	49.00 to 50.00
No. 1 factory bundles	53.00 to 54.00
No. 2 bundles	39.00 to 40.00
No. 1 busheling	49.00 to 50.00
Machine shop turn.	34.00 to 35.00
Mixed bor. and ms. turn.	34.00 to 35.00
Shoveling turnings	38.00 to 39.00
Cast iron borings	38.00 to 39.00
Low phos. punch'gs plate	53.00 to 54.00
Heavy turnings	44.00 to 45.00
No. 1 RR. hvy. melting	52.00 to 53.00
Scrap rails, random lgth.	65.00 to 66.00
Rails 2 ft and under	68.00 to 69.00
RR. steel wheels	68.00 to 69.00
RR. spring steel	68.00 to 69.00
RR. couplers and knuckles	68.00 to 69.00
No. 1 machinery cast	54.00 to 55.00
Cupola cast	47.00 to 48.00
Heavy breakable cast	45.00 to 46.00

Chicago

No. 1 hvy. melting	$43.00 to $44.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 dealer bundles	44.00 to 45.00
No. 1 factory bundles	48.00 to 50.00
No. 2 bundles	37.00 to 38.00
No. 1 busheling	43.00 to 44.00
Machine shop turn.	28.00 to 29.00
Mixed bor. and turn.	30.00 to 31.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	30.00 to 31.00
Low phos. forge crops	57.00 to 58.00
Low phos. punch'gs plate	51.00 to 52.00
Low phos. 3 ft and under	50.00 to 51.00
No. 1 RR. hvy. melting	49.00 to 50.00
Scrap rails, random lgth.	56.00 to 57.00
Rerolling rails	59.00 to 60.00
Rails 2 ft and under	60.00 to 61.00
Locomotive tires cut	54.00 to 55.00
Cut bolsters & side frames	52.00 to 53.00
Angles and splice bars	57.00 to 58.00
RR. steel car axles	72.00 to 73.00
RR. couplers and knuckles	51.00 to 52.00
No. 1 machinery cast	48.00 to 49.00
Cupola cast	42.00 to 43.00
Heavy breakable cast	41.00 to 42.00
Cast iron brake shoe	42.00 to 43.00
Cast iron wheels	50.00 to 51.00
Malleable	57.00 to 59.00
Stove plate	42.00 to 43.00
Steel car wheels	54.00 to 55.00

Philadelphia Area

No. 1 hvy. melting	$51.00 to $52.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 dealer bundles	51.00 to 52.00
No. 2 bundles	40.00 to 41.00
No. 1 busheling	51.00 to 52.00
Machine shop turn.	40.00 to 41.00
Mixed bor. short turn.	42.00 to 43.00
Cast iron borings	42.00 to 43.00
Shoveling turnings	44.00 to 45.00
Clean cast chem. borings	45.00 to 46.00
Low phos. 5 ft and under	57.00 to 58.00
Low phos. 2 ft and under	58.00 to 59.00
Low phos. punch'gs	58.00 to 59.00
Elec. furnace bundles	56.00 to 57.00
Heavy turnings	49.00 to 50.00
RR. steel wheels	64.00 to 65.00
RR. spring steel	64.00 to 65.00
Rails 18 in. and under	72.00 to 73.00
Cupola cast	47.00 to 48.00
Heavy breakable cast	55.00 to 56.00
Cast iron car wheels	61.00 to 62.00
Malleable	63.00 to 64.00
Unstripped motor blocks	41.00 to 42.00
No. 1 machinery cast	55.00 to 56.00

Cleveland

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 dealer bundles	44.00 to 45.00
No. 1 factory bundles	48.00 to 49.00
No. 2 bundles	36.00 to 37.00
No. 1 busheling	44.00 to 45.00
Machine shop turn.	26.50 to 27.50
Mixed bor. and turn.	31.50 to 32.50
Shoveling turnings	31.50 to 32.50
Cast iron borings	31.50 to 32.50
Cut structr'l & plates, 2 ft & under	51.00 to 52.00
Drop forge flashings	44.00 to 45.00
Low phos. punch'gs, plate	45.00 to 46.00
Foundry steel, 2 ft & under	50.00 to 51.00
No. 1 RR. heavy melting	49.00 to 50.00
Rails 2 ft and under	69.00 to 70.00
Rails 18 in. and under	70.00 to 71.00
Railroad grate bars	35.00 to 36.00
Steel axle turnings	33.00 to 34.00
Railroad cast	53.00 to 54.00
No. 1 machinery cast	52.00 to 53.00
Stove plate	49.00 to 50.00
Malleable	57.00 to 58.00

Youngstown

No. 1 hvy. melting	$47.00 to $48.00
No. 2 hvy. melting	43.00 to 44.00
No. 1 dealer bundles	47.00 to 48.00
No. 2 bundles	39.00 to 40.00
Machine shop turn.	28.00 to 29.00
Shoveling turnings	34.00 to 35.00
Cast iron borings	34.00 to 35.00
Low phos. plate	48.00 to 49.00

Buffalo

No. 1 hvy. melting	$46.00 to $47.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 busheling	46.00 to 47.00
No. 1 dealer bundles	46.00 to 47.00
No. 2 bundles	37.00 to 38.00
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	30.00 to 31.00
Shoveling turnings	34.00 to 35.00
Cast iron borings	32.00 to 33.00
Low phos. plate	51.00 to 52.00
Scrap rails, random lgth.	61.00 to 62.00
Rails 2 ft and under	65.00 to 66.00
RR. steel wheels	54.00 to 55.00
RR. spring steel	54.00 to 55.00
RR. couplers and knuckles	54.00 to 55.00
No. 1 machinery cast	49.00 to 50.00
No. 1 cupola cast	46.00 to 47.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	41.00 to 42.00
No. 2 bundles	32.00 to 33.00
No. 1 busheling	41.00 to 42.00
Drop forge flashings	41.00 to 42.00
Machine shop turn.	25.00 to 26.00
Mixed bor. and turn.	28.00 to 29.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	28.00 to 29.00
Low phos. punch'gs, plate	41.00 to 42.00
No. 1 cupola cast	46.00 to 47.00
Heavy breakable cast	44.00 to 45.00
Stove plate	45.00 to 46.00
Automotive cast	54.00 to 55.00

St. Louis

No. 1 hvy. melting	$47.00 to $48.00
No. 2 hvy. melting	43.00 to 44.00
No. 1 dealer bundles	47.00 to 48.00
No. 2 bundles	37.50 to 38.50
Machine shop turn.	31.00 to 32.00
Cast iron borings	33.00 to 34.00
Shoveling turnings	33.00 to 34.00
No. 1 RR. hvy. melting	49.50 to 50.50
Rails, random lengths	55.00 to 56.00
Rails 18 in. and under	63.00 to 64.00
Locomotive tires uncut	50.00 to 51.00
Angles and splice bars	54.00 to 55.00
Std. steel car axles	72.00 to 73.00
RR. specialties	53.00 to 54.00
Cupola cast	43.00 to 44.00
Heavy breakable cast	40.00 to 41.00
Cast iron brake shoes	46.00 to 47.00
Stove plate	40.00 to 41.00
Cast iron car wheels	46.00 to 47.00
Rerolling rails	61.00 to 62.00
Unstripped motor blocks	40.00 to 41.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$43.00 to $44.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 dealer bundles	43.00 to 44.00
No. 2 bundles	31.00 to 32.00
No. 1 busheling	43.00 to 44.00
Elec. furnace, 3 ft & under	49.00 to 50.00
Machine shop turn.	26.00 to 27.00
Mixed bor. and short turn.	28.00 to 29.00
Shoveling turnings	30.00 to 31.00
Clean cast. chem. borings	30.00 to 31.00
No. 1 machinery cast	44.00 to 45.00
Mixed cupola cast	38.00 to 39.00
Heavy breakable cast	45.00 to 46.00
Stove plate	36.00 to 37.00
Unstripped motor blocks	29.00 to 30.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$45.00 to $46.00
No. 2 hvy. melting	37.00 to 38.00
No. 2 dealer bundles	34.00 to 35.00
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	31.00 to 32.00
Shoveling turnings	34.00 to 35.00
Clean cast chem. borings	31.00 to 32.00
No. 1 machinery cast	48.00 to 49.00
Mixed yard cast	42.50 to 43.50
Charging box cast	46.00 to 47.00
Heavy breakable cast	46.00 to 47.00
Unstripped motor blocks	32.00 to 33.00

Birmingham

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	42.00 to 43.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	33.00 to 34.00
Shoveling turnings	35.00 to 36.00
Cast iron borings	27.00 to 28.00
Electric furnace bundles	48.00 to 49.00
Bar crops and plate	51.00 to 52.00
Structural and plate, 2 ft	50.00 to 51.00
No. 1 RR. hvy. melting	48.00 to 49.00
Scrap rails, random lgth.	51.00 to 52.00
Rails, 18 in. and under	58.00 to 59.00
Angles & splice bars	56.00 to 57.00
Rerolling rails	61.00 to 62.00
No. 1 cupola cast	50.00 to 51.00
Stove plate	50.00 to 51.00
Charging box cast	38.00 to 39.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	39.00 to 40.00
Mashed tin cans	15.00 to 16.00
Elec. furnace, 2 ft & under	46.00 to 47.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$43.00 to $44.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	43.00 to 44.00
No. 2 bundles	33.00 to 34.00
Machine shop turn.	31.00 to 32.00
Mixed bor. and turn.	30.00 to 31.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	30.00 to 31.00
Low phos. 18 in. & under	53.00 to 54.00
Rails, random lengths	57.00 to 58.00
Rails, 18 in. and under	67.00 to 68.00
No. 1 cupola cast	45.00 to 46.00
Hvy. breakable cast	46.00 to 47.00
Drop broken cast	55.00 to 56.00

San Francisco

No. 1 hvy. melting	$55.00
No. 2 hvy. melting	50.00
No. 1 dealer bundles	54.00
No. 2 bundles	38.00
Machine shop turn.	35.00
Cast iron borings	35.00
No. 1 RR. hvy. melting	55.00
No. 1 cupola cast	57.00

Los Angeles

No. 1 hvy. melting	$55.00
No. 2 hvy. melting	51.00
No. 1 dealer bundles	54.00
No. 2 bundles	36.00
Machine shop turn.	35.00
Shoveling turnings	37.00
Cast iron borings	34.00
Elec. furn. 1 ft. and under (foundry)	66.00
No. 1 RR. hvy. melting	55.00
No. 1 cupola cast	$57.00 to 58.00

Seattle

No. 1 hvy. melting	$55.00
No. 2 hvy. melting	51.00
No. 2 bundles	$31.00 to 34.00
No. 1 cupola cast	55.00
Mixed yard cast	55.00

Hamilton Ont.

No. 1 hvy. melting	$48.00
No. 2 hvy. melting	43.00
No. 1 dealer bundles	48.00
No. 2 bundles	37.00
Mixed steel scrap	40.00
Busheling	34.00
Bush., new fact., prep'd	46.00
Bush., new fact., unprep'd	42.00
Machine shop turn.	27.00
Short steel turn.	33.00
Mixed bor. and turn.	24.00
Rails, rerolling	54.00
Cast scrap	50.00

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Expect Battle Over Tin Pact Prices

Malaya paces producer demand for higher buffer price limits.

Consumers opposed, say it would boost price on world market.

Key will be countries on both sides.

▪ Battle lines have been drawn at the meeting of the International Tin Agreement Council in London. The issue: Whether or not to lift floor and ceiling prices of the buffer stock.

People in this country, close to the world tin market, had previously indicated this would be a major item at the council table. Now they say it will be "a dog fight" before the question is resolved. Reason: Malaya, with biggest block of producing votes, is throwing its weight behind a change. This was announced by A. D. Dawson, a key member of the Malayan Dept. of Commerce, before he left for the London meeting.

Buffer Stock Aim—Tin observers say that even with the Malayan stand it is still too early to predict the outcome. Best guess right now, they say, is some change but considerably less than is being requested.

Buffer stock is intended to contain money and tin contributed by member countries. It is considered a base for buying and selling on the open market, to balance supply and demand and stabilize price. The fly in the ointment: Buffer stock has no tin.

Rules let members substitute money for their quota of metal. Rate of substitution was favorable, so all producers sent money.

Current regulations, under fire, which dictate buffer stock action are:

Tin price (per lb)	Action
Over $1.10	Manager must sell
$1.00 to $1.10	Manager may sell
90¢ to $1.00	No action possible
80¢ to 90¢	Manager may buy
Below 80¢	Manager must buy

Floor is 80¢; ceiling is $1.10. The current price is around $1 per lb.

Reasons Pro and Con—Advocates of revision say a change is necessary to make the group operative. There is almost no chance of tin dropping to 90¢ per lb within a year at least, they say. And if the price rises, the buffer stock manager simply has nothing to sell.

Opponents say a change would only strengthen an already too strong price, and not the organization. Most U. S. observers are on this side of the fence. But the U. S. is not a member so their opinions are unofficial. Hope is that the U. S. will attempt to influence proceedings because of its position as the world's leading consuming country.

Total of 2000 votes are assigned half to producers and half to consumers. Bolivia, instigator of the revision move, has 229, Malaya has 385. With the majority of producers votes accounted for, others are expected to go along. Indonesia, which has the other big block of votes, 229, is racked with civil strife and in no position to deviate.

Consumer Votes Key—Big question is consumer vote. A simple majority is required for any action. The slightest split would doom the current setup. Several consumers also have a finger in the producing pie. United Kingdom (416 votes), Netherlands (57 votes), and Belgium (41 votes) all have tin smelters, export part of this output.

Representatives on the International Tin Agreement Council from these countries will be under pressure from both directions. Other consumers, with less than half consumers' votes, will stand solid against change.

One U. S. tin trader is pessimistic about the outcome. He believes revisions will be made and the tin price will rise. He says producers consider tin use pretty well fixed, don't believe it would fluctuate much if price was boosted.

This trader believes the floor and ceiling will be squeezed closer together, some thing like this:

Tin Price (per lb)	Action
Over 108.75¢	Manager must sell
101.25¢ to 108.75¢	Manager may sell
93.75¢ to 101.25¢	No action possible
86.25¢ to 93.75¢	Manager may buy
Below 86.25¢	Manager must buy

Suspend Limits — A representative of one of the producers, in this country, says floor and ceiling may be temporarily suspended. He expects special conditions to be set up,

Primary Prices

(cents per lb)	Current price	last price	date of change
Aluminum ingot	27.10	25.90	8/10/56
Aluminum pig	25.00	24.00	8/10/56
Copper (E)	32.00	34.00	2/18/57
Copper (CS)	31.00	32.00	2/20/57
Copper (L)	32.00	34.00	2/19/57
Lead, St. L.	15.80	16.30	1/13/56
Lead, N. Y.	16.00	16.50	1/13/56
Magnesium ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	250-275	270-300	12/4/56
Zinc, E. St. L.	13.50	13.00	1/6/56
Zinc, N. Y.	14.00	13.50	1/6/56

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig. Velasco, Tex. NICKEL: Port Colbourne, Canada. ZINC: prime western. TIN: see column at right, other primary prices, pg. 152.

temporarily, to permit the buffer stock manager to accumulate tin. They will be removed when this has been accomplished.

Zinc and Lead

Congress may be in the process of writing finis to the continued stockpiling of zinc and lead. A House of Representatives appropriations subcommittee recommended the Budget Bureau request for $130 million for purchase of critical and strategic materials be slashed to $19 million.

Industry observers predict a wide open floor fight on this particular item. Most believe the House will appropriate much more than the recommended sum. But all admit there isn't a prayer the amount will approach the original $130 million request.

How Much Longer—The gap between asked and granted may be the timetable for further government stocking of lead and zinc.

At the end of 1956 producers of both metals expressed confidence that government stockpiling would continue through 1957. Lately, there have been some backroom mutterings that 1957 would be the end of the line. The government emphasized this by taking less of both metals on its last stockpile offering call.

Slight Drop—If government stops taking lead and zinc, price of both metals will drop. Zinc industry is confident, however, that the drop will be only a moderate one.

Zinc consumption is up, they point out. Auto demand is off, currently, but automakers are using more zinc per model, so the potential is there.

Price will become more volatile, say producers. However, this will be in line with what was traditional for the industry before government stockpiling.

Tin prices for the week: March 31 — 98.75; March 14 — 99.625; March 15—100.375; March 18—99.625; March 19—99.50.*

* Estimate.

AGAIN! UDYLITE Hi-C SOLVES A PRODUCTION PROBLEM

Recently, a large supplier of nickel-plated parts was faced with the problem of doubling his production to meet the increased demands of his customers. There was no additional floor space for extra tanks or equipment.

The solution to the problem was Udylite's Hi-C Bright Nickel Process. By simply changing his 13,000 gallons of bright nickel solution to the new Udylite Hi-C Bright Nickel, the increased production was obtained.

Current densities were increased as the greater conductivity of the high chloride solution permitted higher current with no burning, even without increased agitation.

In addition, this user of Udylite Hi-C Bright Nickel Process benefited by better throwing power, which meant less nickel was used to obtain thickness requirements in recesses. Also, fewer anodes were needed since the Hi-C process provided the best anode corrosion of any nickel bath.

Why not find out what Udylite's exclusive Hi-C Bright Nickel Process can do for you? Write today for a new free folder describing Hi-C Processes for rack and barrel plating—or call your nearby Udylite representative.

THE Udylite CORPORATION DETROIT 11, MICHIGAN

WORLD'S LARGEST PLATING SUPPLIER

NONFERROUS PRICES *(Effective March 19, 1957)*

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3
1800, 1100, 3003	44.3	42.1	40.9	40.2
5052	51.8	46.8	45.1	42.9
6061-0	48.9	44.6	42.8	42.6

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	42.7-44.4	57.6-61.1
12-14	43.4-44.8	58.4-62.7
24-26	46.4-46.9	68.7-73.1
36-38	54.8-55.4	91.5-94.9

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	¾-1	1¼-1½
Price	59.7	58.8	57.4	55.2

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length" →	72	96	120	144
.019 gage	$1 352	$1 803	$2 254	$2 704
.024 gage	1 686	2 252	2 815	3 378

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type ↓ Gage →	.250-3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade		67.9	69.0	77.9	103.1
AZ31B Spec.		93.3	95.7	108.7	171.3
Tread Plate		70.6	71.7		
Tooling Plate	73.0				

Extruded Shapes

factor →	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks		87	

COPPER, BRASS, BRONZE

(Freight included on 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	54.13		51.36	54.32
Brass, 70/30	47.52	48.06	47.46	50.43
Brass, Low	50.20	50.74	50.14	53.01
Brass, R.L.	51.14	51.68	51.08	53.95
Brass, Naval	51.09		46.00	55.10
Muntz Metal	49.79		45.60	
Comm. Bz.	52.63	53.17	52.57	55.19
Mang. Bz.	55.43		49.53	
Phos. Bz. 5%	73.17		73.67	

Free Cutting Brass Rod..... $37.68

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $11.00-$12.10; alloy, $14.75; Plate, HR, commercially pure, $9.25-$9.75; alloy, $11.25. Wrie, rolled and/or drawn, commercially pure, $8.50-$9.00; alloy, $11.00; Bar, HR or forged, commercially pure, $7.10-$7.35; alloy, $7.10-$7.80; billets, HR, commercially pure, $6.85-$7.10; alloy, $6.85-$7.05.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Antimony, American, Laredo, Tex... 33.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, 99.9%, small lots ..... $ 4.55
Chromium, 99.8% metallic basis ... $ 1.31
Cobalt, 97-99% (per lb) .... $2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined ..... $48.50-$53.50
Gold, U. S. Treas., per troy oz. $35.00
Indium, 99.9% dollars per troy oz... $ 2.25
Iridium, dollars per troy oz....$90 to $100
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $255 to $257
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz...$23 to $24
Platinum, dollars per troy oz....$92 to $95
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) 91.375
Thorium, per kg. $43.00
Uranium, normal per kg $40.00
Vanadium ..... $ 3.45
Zirconium sponge $10.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 31.50
No. 120 ..... 30.00
No. 123 ..... 28.50
80-10-10 ingot
No. 305 ..... 35.50
No. 315 ..... 33.50
88-10-2 ingot
No. 210 ..... 43.25
No. 215 ..... 40.00
No. 245 ..... 35.50
Yellow ingot
No. 405 ..... 25.25
Manganese bronze
No. 421 ..... 28.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 24.75-25.50
0.60 copper max. 24.50-25.25
Piston alloys (No. 122 type) 22.25-23.50
No. 12 alum. (No. 2 grade) ... 22.25-23.50
108 alloy 22.25-23.50
195 alloy 24.25-25.75
13 alloy (0.60 copper max.) ... 24.50-25.25
AXS-679 ..... 22.25-23.50

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 23.00-23.75
Grade 2—92-95% 21.75-22.00
Grade 3—90-92% 20.75-21.50
Grade 4—85-90% 20.25-20.75

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	28	27¼
Yellow brass	21⅞	20⅛
Red brass	25	24¼
Comm. bronze	25⅞	25⅛
Mang. bronze	20½	19¾
Yellow brass rod ends	21⅝	....

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 26⅝
No. 2 copper wire 25⅛
Light copper 22⅞
*Refinery brass 23⅝
Copper bearing material 23⅛
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 26⅝
No. 2 copper wire 25⅛
Light copper 22⅞
No. 1 composition 23½
No. 1 comp turnings 23
Hvy. yellow brass solids 17¼
Brass Pipe 19¾
Radiators ..... 17½—18

Aluminum

Mixed old cast. ..... 14½—15
Mixed new clips ..... 15½—16½
Mixed turnings, dry ..... 14 —15

Dealer's Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No 1 copper wire ..... 23½—24
No. 2 copper wire ..... 22 —22½
Light copper ..... 20 —20½
Auto radiators (unsweated) .. 15 —15½
No. 1 composition ..... 20½—21
No. 1 composition turnings... 20 —20½
Cocks and faucets ..... 16 —16½
Clean heavy yellow brass.... 14 —14½
Brass pipe ..... 16½—17
New soft brass clippings .... 18½—19
No. 1 brass rod turnings .... 15¾—16

Aluminum

Alum. pistons and struts .... 5 — 5½
Aluminum crankcases ..... 10 —10½
1100 (2S) aluminum clippings 13¼—14
Old sheet and utensils ..... 10 —10½
Borings and turnings ..... 6½— 7
Industrial castings ..... 10 —10½
2024 (24S) clippings ..... 11½—12

Zinc

New zinc clippings ..... 6½— 7
Old zinc ..... 4½— 5
Zinc routings ..... 2½— 2¾
Old die cast scrap ..... 2¼— 2½

Nickel and Monel

Pure nickel clippings ..... $1.65-$1.75
Clean nickel turnings ..... $1.40-$1.50
Nickel anodes ..... $1.65-$1.75
Nickel rod ends ..... $1.65-$1.75
New Monel clippings 78-80
Clean Monel turnings 68
Old sheet Monel 73-75
Nickel silver clippings, mixed. 21
Nickel silver turnings, mixed 18

Lead

Soft scrap lead ..... 12 —12½
Battery plates (dry) ..... 6½— 6¾
Batteries, acid free ..... 3¾— 4

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixed common babbitt ..... 12 —12½
Solder joints ..... 17½—18
Siphon tops 42
Small foundry type ..... 14¼—14½
Monotype ..... 14 —14½
Lino. and stereotype ..... 13 —13½
Electrotype ..... 12½—12¾
Hand picked type shells ..... 9½—10
Lino. and stereo. dross ..... 4¾— 5
Electro. dross ..... 4 — 4¼

IRON AGE

STEEL PRICES

(Effective March 19, 1957)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$107.00 *B3*		5.05 *B3*	7.40 *B3*	5.05 *B3*						
	Buffalo, N. Y.	$74.00 *B3, R3*	$91.50 *B3, R3*	$107.00 *B3, R3*	5.90 *B3*	5.05 *B3*	7.40 *B3*	5.05 *B3*	4.675 *B3, R3*	6.85 *R7*	6.95 *B3*			
	Claymont, Del.													
	Harrison, N. J.													14.55 *C11*
	Conshohocken, Pa.		$96.50 *A2*	$114.00 *A2*					4.725 *A2*	6.90 *A2*	6.95 *A2*			
	New Bedford, Mass.									7.30 *R6*				
	Johnstown, Pa.	$74.00 *B3*	$91.50 *B3*	$107.00 *B3*		5.05 *B3*	7.40 *B3*							
	Boston, Mass.									7.40 *T8*				14.90 *T8*
	New Haven, Conn.									7.30 *D1*				
	Baltimore, Md.									6.85 *T8*				
	Phoenixville, Pa.					5.85 *P2*		5.85 *P2*						
	Sparrows Pt., Md.								4.675 *B3*		6.95 *B3*			
	Bridgeport, Wallingford, Conn.	$79.00 *N8*	$96.50 *N8*	$107.00 *N8*						7.30 *W1* 6.95 *N8*				
	Pawtucket, R. I. Worcester, Mass.									7.48 *A5,N7*				14.90 *N7*
MIDDLE WEST	Alton, Ill.								4.875 *L1*					
	Ashland, Ky.								4.675 *A7*					
	Canton-Massillon, Dover, Ohio		$94.00 *R3*	$107.00 *R3, T5*						6.85 *G4*		10.10 *G4*		14.55 *G4*
	Chicago, Ill. Franklin Park, Ill.	$74.00 *U1, R3*	$91.50 *U1, R3,W8*	$107.00 *U1, R3,W8*	5.90 *U1*	5.00 *U1,W8* 5.50 *P13*	7.35 *U1,Y1* 6.00 *W8*	5.00 *U1*	4.675 *N4* 4.675 *A1*	6.95 *A1,T8*			7.75 *W8, S9*	14.55 *A1, S9,T8*
	Cleveland, Ohio									6.85 *A5,J3*			7.75 *J3*	
	Detroit, Mich.			$107.00 *R5*					4.775 *G3, M2*	6.95 *M2,G3, D2,P11*	7.05 *G3*	10.10 *G3, D2*	7.75 *G3*	
	Anderson, Ind.									6.85 *G4*		10.10 *G4*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$74.00 *U1*	$91.50 *U1*	$107.00 *U1, Y1*	5.90 *I3*	5.00 *U1*	7.35 *U1,I3*	5.25 *I3*	4.675 *U1, I3,Y1*	6.85 *Y1*	6.95 *U1, I3,Y1*	10.20 *Y1*	7.75 *U1, Y1*	
	Sterling, Ill.	$74.00 *N4*							4.775 *N4*					
	Indianapolis, Ind.									7.00 *C5*				
	Newport, Ky.												7.75 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$91.50 *S1, C10*	$107.00 *S1, C10*					4.675 *S1, R3*	6.85 *T4*	6.95 *S1, R3*	10.00 *S1, R3*	7.75 *S1*	14.55 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$74.00 *U1*	$91.50 *U1, C11*	$107.00 *U1, C11*	5.90 *U1*	5.00 *U1, J3*	7.35 *U1, J3*	5.00 *U1*	4.675 *P6*	5.750 *P6* 6.85 *J3,B4, S7*			7.75 *S9*	14.55 *S9*
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.					5.00 *W3*			4.675 *W3*	6.85 *W3,F3*	6.95 *W3*	9.65 *W3*		
	Youngstown, Ohio	$74.00 *R3*	$91.50 *Y1, C10*	$107.00 *Y1*			7.35 *Y1*		4.675 *U1, Y1*	6.85 *Y1,C5*	6.95 *U1, Y1*	10.20 *Y1*	7.75 *U1, Y1*	
WEST	Fontana, Cal.	$83.50 *K1*	$101.00 *K1*	$128.00 *K1*		5.75 *K1*	8.10 *K1*	5.90 *K1*	5.525 *K1*	8.70 *K1*				
	Geneva, Utah		$91.50 *C7*			5.00 *C7*	7.35 *C7*							
	Kansas City, Mo.					5.10 *S2*	7.45 *S2*		4.925 *S2*		7.20 *S2*			
	Los Angeles, Torrance, Cal.		$101.00 *B2*	$127.00 *B2*		5.70 *C7, B2*	8.05 *B2*		5.425 *B2, C7*	8.90 *C1*			8.95 *B2*	
	Minnequa, Colo.					5.30 *C6*			5.775 *C6*					
	Portland, Ore.					5.75 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$101.00 *B2*			5.65 *B2*	8.00 *B2*		5.425 *C7,B2*					
	Seattle, Wash.		$105.00 *B2*			5.75 *B2*	8.10 *B2*		5.675 *B2*					
SOUTH	Atlanta, Ga.								4.875 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$74.00 *T2*	$91.50 *T2*			5.00 *T2,R3* 5.25 *C16*	7.35 *T2*		4.675 *T2,R3* 4.975 *C10* 4.925 *C16*		6.95 *T2*			
	Houston, Lone Star, Texas	$80.00 *L3*	$96.50 *S2*	$112.00 *S2*		5.10 *S2*	7.45 *S2*		4.925 *S2*		7.20 *S2*			

STEEL PRICES

(Effective March 19, 1957)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled *19* ga.		Cokes* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Holloware Enameling *29* ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.675 *B3*	5.75 *B3*				6.90 *B3*	8.525 *B3*			5.80 *W6*	† Special coated mfg. terne deduct 50c from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25c. ELECTRO: 0.50-lb. add 25c; 0.75-lb. add 65c; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65c.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.725 *A2*	5.80 *A2*				6.95 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										5.80 *B3*			
	Fairless, Pa.	4.725 *U1*	5.80 *U1*				6.95 *U1*	8.575 *U1*				$9.80 *U1*	$8.50 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.675 *B3*	5.75 *B3*	6.30 *B3*			6.90 *B3*	8.575 *B3*	9.275 *B3*		5.90 *B3*	$9.80 *B3*	$8.50 *B3*	
	Worcester, Mass.										6.10 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										6.00 *L1*			
	Ashland, Ky.	4.675 *A7*		6.30 *A7*	6.325 *A7*									
	Canton-Massillon, Dover, Ohio			6.30 *R3,R1*										
	Chicago, Joliet, Ill.	4.675 *W8, A1*					6.90 *U1*			5.80 *K2*	5.80 *A5,R3, N4,W8, K2*			
	Sterling, Ill.										5.90 *N4, K2*			
	Cleveland, Ohio	4.675 *J3, R3*	5.75 *J3, R3*		6.325 *R3*		6.90 *R3*	8.525 *R3, J3*			5.80 *A5*			
	Detroit, Mich.	4.775 *G3, M2*	5.85 *G3* 5.75 *M2*				7.00 *G2*	8.625 *G3*						
	Newport, Ky.	4.675 *A9*	5.75 *A9*											
	Gary, Ind. Harbor, Indiana	4.675 *U1, I3,Y1*	5.75 *U1, I3,Y1*	6.30 *U1, I3*	6.325 *U1, I3,Y1*	6.70 *U1*	6.90 *U1, Y1,I3*	8.525 *U1, Y1*			5.80 *Y1*	$9.70 *U1, Y1*	$8.40 *I3, U1,Y1*	7.15 *U1, Y1*
	Granite City, Ill.	4.875 *G2*	5.95 *G2*	6.50 *G2*	6.525 *G2*								$8.50 *G2*	7.25 *G2*
	Kokomo, Ind.			6.40 *C9*							5.90 *C9*			
	Mansfield, Ohio		5.75 *E2*			6.70 *E2*								
	Middletown, Ohio		5.75 *A7*	6.30 *A7*	6.325 *A7*	6.70 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.675 *S1, R3,N3*	5.75 *R3*	6.30 *R3*	6.325 *N3*	6.70 *N3*	6.90 *S1, R3*	8.525 *S1, R3*					$8.40 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.675 *U1, J3,P6*	5.75 *U1, J3,P6*	6.30 *U1, J3*	6.325 *U1*		6.90 *U1, J3,R3*	8.525 *U1, J3*	9.275 *U1*		5.80 *A5, P6,J3*	$9.70 *J3, U1*	$8.40 *U1, J3*	7.15 *U1, J3*
	Portsmouth, Ohio	4.675 *P7*	5.75 *P7*								5.80 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.675 *W3, W5*	5.75 *W5, W5,F3*	6.30 *W3, W5*		6.70 *W3, W5*	6.90 *W3*	8.525 *W3*				$9.70 *W5, W3*	$8.40 *W5, W3*	7.15 *W5* 7.40 *W3*
	Youngstown, Ohio	4.675 *U1, Y1*	5.75 *Y1*		6.325 *Y1*		6.90 *Y1*	8.525 *Y1*			5.80 *Y1*			7.15 *Y1*
WEST	Fontana, Cal.	5.525 *K1*	7.00 *K1*				7.75 *K1*	9.775 *K1*				$10.45 *K1*	$9.15 *K1*	
	Geneva, Utah	4.775 *C7*												
	Kansas City, Mo.										6.05 *S2*			
	Los Angeles, Torrance, Cal.										6.60 *B2*			
	Minnequa, Colo.										6.05 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.375 *C7*	6.70 *C7*	7.05 *C7*							6.60 *C7*	$10.45 *C7*	$9.15 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.675 *T2, R3*	5.75 *T2*	6.30 *T2, R3*							5.80 *T2,R3*	$9.80 *T2*	$8.50 *T2*	
	Houston, Tex.										6.05 *S2*			

IRON AGE

STEEL PRICES

(Effective March 19, 1957)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.125 *B3*	8.325 *B3*	7.40 *B3*					
	Buffalo, N. Y.	5.075 *B3,R3*	5.075 *B3,R3*	6.90 *B5*	6.125 *B3,R3*	8.325 *B5,B3*	7.40 *B3*	4.85 *B3*				7.20 *W6*
	Claymont, Del.							5.70 *C4*		6.85 *C4*	7.55 *C4*	
	Coatesville, Pa.							5.25 *L4*		6.85 *L4*	7.55 *L4*	
	Conshohocken, Pa.							4.95 *A2*	5.925 *A2*	6.85 *A2*	7.25 *A2*	
	Harrisburg, Pa.							5.80 *P2*	6.275 *P2*			
	Hartford, Conn.			7.35 *R3*		8.625 *R3*	7.40 *B3*					
	Johnstown, Pa.	5.075 *B3*	5.075 *B3*		6.125 *B3*			4.85 *B3*		6.85 *B3*	7.25 *B3*	7.20 *B3*
	Fairless, Pa.	5.225 *U1*	5.225 *U1*		6.275 *U1*							
	Newark, N. J.			7.30 *W10*		8.50 *W10*						
	Camden, N. J.			7.30 *P10*		8.50 *P10*						
	Bridgeport, Conn. Putnam, Conn.	5.30 *N8*	5.30 *N8*	7.20 *N8* 7.40 *W10*	6.20 *N8*	8.475 *N8*	7.50 *N8*					
	Sparrows Pt., Md.		5.075 *B3*					4.85 *B3*		6.85 *B3*	6.85 *B3*	7.30 *B3*
	Palmer, Worcester, Readville, Mass. Milton, Pa.	5.225 *M7*	5.225 *M7*	7.40 *B5,C14*		8.625 *A5* 8.625 *B5*						7.50 *A5,W6* 9.025 *T8*
	Spring City, Pa.			7.30 *K4*		8.50 *K4*						
MIDDLE WEST	Alton, Ill.	5.275 *L1*										7.40 *L1*
	Ashland, Newport, Ky.							4.85 *A7,A9*		6.85 *A9*		
	Canton, Massillon, Ohio			6.85 *R3,R2*	6.125 *R3,T5*	8.325 *R3,R2, T5*						
	Chicago, Joliet, Ill.	5.075 *U1,R3, W8,N4* 5.575 *P13*	5.075 *U1,R3, N4* 5.575 *P13*	6.85 *A5,B5, W10,L2 W8,N9*	6.125 *U1,R3, W8*	8.325 *A5,B5, W8,L2,N9, W10*	5.875 *W8* 7.425 *U1*	4.85 *U1,I3, W8,A1*	5.925 *U1*	6.85 *U1,W8*	7.25 *U1*	7.20 *A5, K2 R3,N4,W7*
	Cleveland, Ohio	5.075 *R3*	5.075 *R3*	6.85 *A5,C13*		8.325 *A5,C13*	7.425 *R3*	4.95 *J3,R3*	5.925 *J3*		7.25 *J3,R3*	7.20 *A5, C13*
	Detroit, Mich.	5.175 *G3*	5.425 *G3*	7.05 *B5,P8* 7.10 *P3* 6.85 *R5*	6.225 *G3* 6.125 *R5*	8.525 *B5,P3, P8* 8.325 *R5*	7.525 *G3*	4.95 *G3*		6.90 *G3*		
	Duluth, Minn.											7.20 *A5*
	Gary, Ind. Harbor, Crawfordsville	5.075 *U1,I3, Y1*	5.075 *U1,I3, Y1*	6.85 *R3,M5*	6.125 *U1,I3, Y1*	8.325 *R3,M4*	7.425 *U1,I3, Y1*	4.85 *U1,I3, Y1*	5.925 *I3*	6.85 *U1,Y1*	7.25 *U1,Y1*	7.30 *M4*
	Granite City, Ill.							5.05 *G2*				
	Kokomo, Ind.											7.30 *C9*
	Sterling, Ill.	5.175 *N4*	5.175 *N4*									7.30 *K2*
	Niles, Warren, Ohio Sharon, Pa.			6.85 *C10*	6.125 *C10,S1*	8.325 *C10*	7.425 *S1*	4.85 *S1,R3*		6.85 *S1*	7.25 *S1,R3*	
	Pittsburgh, Pa. Midland, Pa.	5.075 *U1, C11,J3*	5.075 *U1,J3*	6.85 *A5,C8, J3,R3,S9 B4,W10,C11*	6.125 *U1, C11,J3*	8.325 *A5,R3, S9,C8,W10, C11*	7.425 *U1,J3*	4.85 *U1,J3*	5.925 *U1*	6.85 *U1,J3*	7.25 *U1,J3*	7.20 *A5,J3, P6*
	Portsmouth, Ohio											7.20 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							4.85 *W5*				
	Youngstown, Ohio	5.075 *U1, Y1,R3*	5.075 *U1, Y1,R3*	6.85 *U1,Y1, F2*	6.125 *U1,Y1*	8.325 *Y1,F2*	7.425 *U1,Y1,*	4.85 *U1,Y1, R3*		6.85 *Y1*	7.25 *Y1* 7.25 *U1*	7.20 *Y1*
WEST	Emeryville, Cal.	5.825 *J5*	5.825 *J5*									
	Fontana, Cal.	5.775 *K1*	5.775 *K1*		7.175 *K1*		8.125 *K1*	5.60 *K1*		7.60 *K1*	8.00 *K1*	
	Geneva, Utah							4.85 *C7*			7.25 *C7*	
	Kansas City, Mo.	5.325 *S2*	5.325 *S2*		6.375 *S2*		7.675 *S2*					7.45 *S2*
	Los Angeles, Torrance, Cal.	5.775 *C7,B2*	5.775 *C7,B2*	8.30 *R3,P14*	7.175 *B2*	10.20 *P14*	8.125 *B2*					8.15 *B2*
	Minnequa, Colo.	5.525 *C6*	5.525 *C6*					5.70 *C6*				7.45 *C6*
	Portland, Ore.	5.825 *O2*	5.825 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	5.775 *C7* 5.825 *B2* 6.025 *P9*	5.775 *C7* 5.825 *B2* 6.025 *P9*				8.175 *B2*					8.15 *C7,C6*
	Seattle, Wash.	5.825 *B2 N6*	5.825 *B2*				8.175 *B2*	5.75 *B2*		7.75 *B2*	8.15 *B2*	
SOUTH	Atlanta, Ga.	5.575 *A8*										7.40 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.075 *T2,R3* 5.325 *C16*	5.075 *T2,R3* 5.325 *C16*	7.45 *C16*			7.425 *T2*	4.85 *T2,R3*			7.25 *T2*	7.20 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.325 *S2*	5.325 *S2*		6.375 *S2*		7.675 *S2*	4.95 *S2* 5.20 *L3*		6.95 *S2*	7.35 *S2*	7.45 *S2*

† Merchant Quality—Specialty Quality .35¢ higher.

STEEL PRICES *(Effective March 19, 1957)*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland.
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metals Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
H1 Hanna Furnace Corp., Detroit
I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland
J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.
K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.
L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.
M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.
O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland
P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.
S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston
U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham
W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.
Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Cal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	7.25	+8.00	10.25	+4.00	13.75	0.50	16.25	1.25	16.75	2.25	17.25	2.75	18.75	2.50								
Youngstown *R3*	9.25	+10.00	12.25	+6.00	15.75	+1.50	18.25	0.25	18.75	1.25	19.25	1.75	20.75	2.50								
Fontana *K1*	+3.75	+23.00	0.75	+19.00	2.75	+14½	5.25	+12¾	5.75	+11¾	6.25	+11.25	7.75	+10.50								
Pittsburgh *J3*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25	5.25	+20.25	1.25	+16.50	3.75	+13.00	5.25	+11.50
Alton, Ill. *L1*	7.25	+8.00	10.25	+4.00	13.75	0.50	16.25	1.25	16.75	2.25	17.25	2.75	18.75	2.50								
Sharon *M3*	9.25	+10.00	12.25	+2.00	15.75	+1.50	18.25	0.25	18.75	1.25	19.25	1.75	20.75	2.50								
Fairless *N2*	7.25	+8.00	10.25	+4.00	13.75	0.50	16.25	1.25	16.75	2.25	17.25	2.75	18.75	2.50								
Pittsburgh *N1*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25	5.25	+20.25	1.25	+16.50	3.75	+13.00	5.25	+11.50
Wheeling *W5*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25								
Wheatland *W4*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25								
Youngstown *Y1*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25	5.25	+20.25	1.25	+16.50	3.75	+13.00	5.25	+11.50
Indiana Harbor *Y1*	8.25	+9.00	13.25	+2.00	14.75	1.50	17.25	2.25	17.75	3.25	18.25	3.75	19.75	4.25								
Lorain *N2*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25	5.25	+20.25	1.25	+16.50	3.75	+13.00	5.25	+11.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	11.75	+2.00	15.75	2.00	18.75	6.50	19.25	5.25	19.75	6.25	20.25	6.75	20.75	5.50								
Youngstown *R3*	13.75	+4.00	17.75	list	20.75	4.50	21.25	4.25	21.75	5.25	22.25	6.75	22.75	5.50								
Fairless *N2*	11.75	+2.00	15.75	2.00	18.75	6.50	19.25	5.25	19.75	6.25	20.25	6.75	20.75	5.50								
Fontana *K1*	0.75		4.75		7.75		8.25		8.75		9.25		9.75									
Pittsburgh *J3*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50
Alton, Ill. *L1*	11.75	+2.00	15.75	2.00	18.75	6.50	19.25	5.25	19.75	6.25	20.25	6.75	20.75	5.50								
Sharon *M3*	13.75	+4.00	17.75	list	20.75	4.50	21.25	4.25	21.75	5.25	22.25	5.75	22.75	5.50								
Pittsburgh *N1*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50
Wheeling *W5*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50								
Wheatland *W4*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50								
Youngstown *Y1*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50
Indiana Harbor *Y1*	12.75	+1.00	16.75	3.00	19.75	7.50	20.25	6.25	20.75	7.25	21.25	7.75	21.75	6.50								
Lorain *N2*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in. 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.68	T-1
18	4	1	—	5	2.385	T-4
18	4	2	—	—	1.185	T-2
1.5	4	1.5	8	—	1.04	M-1
6	4	3	6	—	1.43	M-3
6	4	2	5	—	1.185	M-2

High-carbon chromium.. .83 D-3, D-5
Oil hardened manganese .45 O-2
Special carbon ..... .41 W-1
Extra carbon ..... .345 W-1
Regular carbon ..... .29 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*A3, J2, L4*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	35.50
	304	34.60	38.00	41.50	37.75
	316	39.70	43.20	46.65	55.50
	321	36.35	39.80	43.50	44.75
	347	39.50	43.95	48.45	54.25
	405	29.20	33.15	37.05	.....
	410, 430	28.70	32.65	36.55	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 39.85; 1 side, 33.00.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	9.00	9.20	
Armature	10.35	10.35	10.85
Elect.	11.00	11.025	11.525
Motor	12.05	12.075	12.575
Dynamo	13.05	13.05	13.55
Trans. 72	14.05	14.05	14.55
Trans. 65	14.60	Grain Oriented	
Trans. 58	15.10	Trans. 80	18.50
Trans. 52	16.15	Trans. 73	19.00

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*) (20¢ higher, HR); Zanesville, Butler (*A7*).

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1957 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Bail Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Annld ¢ lb.	Merch. Wire Galv. ¢ lb.
Alabama City *R3*	167	181	195	187	8.10	8.50	
Aliquippa, Pa. *J3****	164	179		181	8.20	8.875	
Atlanta *A8***	166	182	192	190	8.05	8.65	
Bartonville *K2***	166	182	192	190	8.05	8.65	
Buffalo *W6*					8.20	8.75	
Chicago, Ill. *N4***	164	180	167	190	188	7.95	8.55
Cleveland *A6*	173				8.20	8.75	
Cleveland *A5*					8.20		
Crawfordsville *M4***	166	182	192	190	8.05	8.65	
Donora, Pa. *A5*	164	176	190	184	8.20	8.75	
Duluth *A5*	164	176	167	190	184	8.20	8.75
Fairfield, Ala. *T2*	164	176	190	184	8.20	8.75	
Galveston *D4*	169;						
Houston *S2*	169	181	195	189	8.20	8.60	
Johnstown, Pa. *B3****	164	180	167	188	8.20	8.95	
Joliet, Ill. *A5*	164	176	190	184	8.20	8.75	
Kokomo, Ind. *C9**	166	178	192	186	8.05	8.45	
Los Angeles *B2***					8.90	9.50	
Kansas City *S2**	169	181	195	189	8.20	8.60	
Minnequa *C6*†	169	181	172	195	189	8.20	8.60
Monessen *P6*	167	185			191	8.10	8.10
Palmer, Mass. *W6*					8.50	9.05	
Pittsburg, Cal. *C7*	183	199		214	204	9.15	9.70
Rankin, Pa. *A5*	164	176		184	8.20	8.75	
So. Chicago *R3*	167	181	195	187	8.10	8.50	
S. San Francisco *C6*			214		8.90	9.30	
Sparrows Pt. *B3****	166		192	190	8.30	9.05	
Struthers, O. *Y1**					7.95	8.45	
Worcester *A5*	170				8.50	9.05	
Williamsport, Pa. *S5*			175				

* Zinc less than .10¢. ‡ Plus zinc extras.
** 13.5 zinc. ‡ Wholesalers only.
*** .10¢ zinc.

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Hot-Rolled (special quality)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta	.15	8.17	9.37	9.83	8.21	8.55	8.59	8.45	.....	10.23	.....	.....	.....	.....
Baltimore	.10	7.79–7.98	8.99–9.08	9.12	8.27–8.46	8.12–8.36	8.57–8.85	8.34–8.53	.....	9.09–9.23	14.99	14.44	18.39	18.09
Birmingham	.15	7.68–7.80	8.88–9.00	9.52	7.78–7.82	8.01–8.16	8.05–8.20	8.07	8.44	10.04–10.12	.....	.....	.....	.....
Boston	.10	9.22	9.83–9.98	11.16	8.89–8.99	9.28	9.20	9.17	9.57	.....	15.79	14.79	19.14	18.39
Buffalo	.15	8.00	9.15	10.90	8.20	8.65	8.65	8.40	8.85	8.85	15.65	14.50–14.65	19.01	18.10–18.25
Chicago	.15	7.80	9.00	9.85	7.82–7.97	8.16–8.31	8.20–8.35	8.07–8.22	8.44–8.59	8.50	15.30	14.10	18.65	17.75
Cincinnati	.15	8.09	9.20	9.90	8.29	8.67	8.89	8.53	8.87	8.99	15.61	14.38	18.96	18.03
Cleveland	.15	7.93	9.13	9.75	8.07	8.54	8.72	8.31	8.67	8.75	15.39	14.39	18.74	17.83–17.99
Denver		9.55	11.09	12.41	9.70	9.80	9.60	9.75	.....	10.54	.....	.....	.....	19.79
Detroit	.15	8.18	9.40	10.20	8.32	8.66	8.89	8.52	8.86	8.85	15.46	14.56	18.81	18.16
Houston		8.80	9.75	.....	8.85	8.80	9.10	9.15	.....	10.65	15.50	.....	19.30	19.05
Kansas City	.20	8.52	9.72	10.07	8.60	8.83	8.87	8.73	.....	9.42	15.32	14.77	18.72	18.42
Los Angeles	.10	9.00–9.20	10.75–10.90	11.75	9.20–9.25	9.75	9.25	9.30	9.30	11.80	16.45	15.45	20.30	19.55
Memphis	.15	8.02	9.22	.....	8.12	8.35	8.39	8.25	.....	9.85	.....	.....	.....	.....
Milwaukee	.15	8.08	9.28	9.97	8.10	9.75	9.25	8.35	8.71	8.72	15.43	14.22	18.78	17.87
New York	.10	8.55	9.76	10.33	9.00	9.11	9.01	9.11	9.48	.....	15.02	14.69	18.42	18.29
Norfolk	.20	8.00	.....	.....	8.40	8.35	8.70	8.45	.....	10.70	.....	.....	.....	.....
Philadelphia	.10	8.25	9.17	10.22–10.39	8.68–8.92	8.78	8.80	8.81	9.18	9.41	15.61	14.61	18.96	18.21
Pittsburgh	.15	7.93	9.14	10.20	7.88–8.07	8.31	8.35	8.22	8.59	8.75	15.30	14.30	18.65	17.90
Portland		8.90	9.65	11.40	10.25–11.05	9.00	9.35	9.45	.....	13.55	16.70	16.10	20.40	20.25
San Francisco	.10	9.05	10.40	10.90	9.05	9.30	9.15	9.15	9.90	12.55	16.45	15.60	20.30	19.70
Seattle		9.35–9.55	10.45–10.70	11.55–11.65	9.50	9.30	9.15–9.35	9.30	9.85	13.40	16.55	15.85	19.50	19.45
Spokane	.15	9.50–9.70	10.60–10.85	11.80	9.70	9.20–9.45	9.30–9.50	9.65	10.00	13.55	.....	16.75	.....	20.35
St. Louis	.15	8.54	9.74†	10.21	8.34	8.67	8.82	8.58	8.96	9.08–9.11	15.66	14.43–14.46	19.01	18.08–18.11
St. Paul	.15	8.29	9.64	10.31	8.39–8.58	8.71–9.05	8.75–9.09	8.52	.....	9.21	.....	14.62	.....	18.27

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.
† 16 gage. †† 13½¢ zinc. ‡ Deduct for country delivery.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Baltimore, Md. *T8*	9.20	10.40	12.60	15.60	18.55
Bristol, Conn. *W12*	.....	10.40	12.60	15.60	18.55
Boston *T8*	9.20	10.40	12.60	15.60	18.55
Buffalo, N. Y. *R7*	7.95	9.80	12.60	15.00	17.95
Carnegie, Pa. *S9*	8.65	10.10	12.30	15.30	.....
Cleveland *A5*	8.65	10.10	12.30	15.30	18.25
Detroit *D1*	8.75	10.20	12.40	15.40	.....
Detroit *D2*	8.75	10.20	12.40	.....	.....
Dover, O. *G4*	8.65	10.10	12.30	15.30	18.25
Franklin Park, Ill. *T8*	8.75	10.10	12.30	15.30	18.25
Harrison, N. J. *C11*	.....	.....	12.30	15.30	18.25
Indianapolis *C5*	8.10	9.95	12.60	15.60	17.95
Los Angeles	10.85	12.30	14.50	.....	.....
New Castle, Pa. *B4*	8.65	10.10	12.30	15.30	.....
New Haven, Conn. *D1*	9.10	10.40	12.60	15.60	.....
Pawtucket, R. I. *N7*	9.20	10.40	12.60	15.60	18.55
Pittsburgh *S7*	8.65	10.10	12.30	15.30	18.25
Riverdale, Ill. *A1*	8.75	10.10	12.30	15.30	18.25
Sharon, Pa. *S1*	8.65	10.10	12.30	15.30	18.25
Trenton *R4*	11.05	10.40	12.60	15.60	18.55
Wallingford *W1*	9.10	10.40	12.60	15.60	18.45
Warren, Ohio *T4*	8.65	10.10	12.30	15.30	18.25
Worcester, Mass. *A5*	9.20	10.40	12.60	15.60	18.55
Youngstown *C5*	7.95	9.80	12.60	15.00	17.95

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	36.34	42.56	33.21	.....
	2½	12	48.94	57.31	44.73	.....
	3	12	56.51	66.18	51.66	.....
	3½	11	65.97	77.25	60.30	.....
	4	10	87.61	102.59	80.07	.....
National Gube	2	13	36.34	42.56	33.21	.....
	2½	12	48.94	57.31	44.73	.....
	3	12	56.51	66.18	51.66	.....
	3½	11	65.97	77.25	60.30	.....
	4	10	87.61	102.59	80.07	.....
Pittsburgh Steel	2	13	36.34	42.56	.....	.....
	2½	12	48.94	57.31	.....	.....
	3	12	56.51	66.18	.....	.....
	3½	11	65.97	77.25	.....	.....
	4	10	87.61	102.59	.....	.....

(Effective March 19, 1957)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.275	6.25	6.60				
So. Chicago *R3*				9.225			
Ensley *T2*	5.275	6.25					
Fairfield *T2*		6.25		9.225		6.275	
Gary *U1*	5.275					6.275	
Huntington *C16*		6.25					
Ind. Harbor *I3*	5.275		6.60	9.225		6.275	
Ind. Harbor *Y1*				8.775			
Johnstown *B3*		6.25					
Joliet *U1*			6.60				
Kansas City *S2*				9.225			13.85
Lackawanna *B3*	5.275	6.25	6.60			6.275	
Lebanon *B3*							13.85
Minnequa *C6*	5.275	6.75	6.60	9.225		6.275	13.85
Pittsburgh *P5*				8.775	12.85		
Pittsburgh *J3*				9.225			
Seattle *B2*				9.725		6.425	13.16
Steelton *B3*	5.275		6.60			6.275	13.85
Struthers *Y1*				8.775			
Torrance *C7*						6.425	
Williamsport *S5*		6.15					
Youngstown *R3*				9.225			

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$15.00 to $15.75
Foundry, beehive (f.o.b. oven)	$17.50 to $19.00
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., Pa.	29.25

ELECTRODES

Cents per lb f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	24.75	40	100, 110	10.70
20	72	24.00	35	110	10.70
16 to 18	72	24.50	30	110	10.85
14	72	25.00	24	72 to 84	11.25
12	72	25.50	20	90	11.00
10	60	26.50	17	72	11.40
9	48	27.00	14	72	11.85
7	60	26.75	12	60	12.95
6	60	30.00	10	60	13.00
4	40	33.25	8	60	13.30
3	40	35.25			
2½	30	37.25			
2	24	57.75			

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Cast elliptical, 18 in. or longer, 5000 lb lots	53.42
Electrodeposited	43.28
Brass, 80-20, ball anodes, 2000 lb or more	54.00
Zinc, ball anodes, 2000 lb lots	21.25
(for elliptical add 2¢ per lb)	
Nickel, 99 pct plus, rolled carbon, 5000 lb	$1.0225
(rolled depolarized add 3¢ per lb)	
Cadmium	$1.70
Tin, ball anodes and elliptical $1.07 per in.	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	77.50
Copper sulphate, 100 lb bags, per cwt.	26.65
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 300 lb	45.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.05
(Philadelphia price 23.30)	
Zinc cyanide, 100 to 900 lb	55.55
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 1 to 20 100-499 lb drums	31.75

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts	Pct Discounts: Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
½" and smaller x 6" and shorter	52½	56½	58½	59½
⅝" thru 1" x longer than 6"	43½	47½	50	51½
Rolled thread carriage bolts ½ in. & smaller x 6 in. and shorter	52½	56½	58½	59½
Lag, all diam. x 6" & shorter	52½	56	58	59
Lag, all diam. longer than 6 in.	44½	48	50	51
Plow bolts, ½" and smaller x 6" and shorter	52	55½	57	58

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full Case or Keg Price
¾ in. or smaller	61½
⅞ in. to 1 in. inclusive	57½
1⅛ in. to 1½ in. inclusive	62½
1⅝ in. and larger	56
C. P. Hex reg. & hvy.	
¾ in. and smaller	61½
⅞ in. to 1½ in. inclusive	57½
1⅝ in. and larger	56
Hot Galv. Nuts (All Types)	
¾ in. and smaller	48
Semi-finished Hex Nuts	
¾ in. or smaller	61½
⅞ in. to 1½ in. inclusive	57½
1⅝ in. and larger	56
(Add 25 pct for broken case or keg quantities)	
Finished	
1 in. and smaller	64

Rivets

	Base per 100 lb
½ in. and larger	$11.50
	Pct Off List
7/16 in. and smaller	23

Cap Screws

	Discount (Packages) Bright	Treated	H. C. Heat
New std. hex head, packaged			
⅝" diam. and smaller x 6" and shorter	44		31
¾", ⅞" and 1" diam. x 6" and shorter	27		9
⅝" diam. and smaller x longer than 6"	14		+ 6
¾", ⅞" and 1" diam. & longer than 6"	½		+24

	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	44	61
¾" through 1" dia. x 6" and shorter	27	49

Minimum quantity—¼" through ⅝" diam., 15,000 pieces; 1/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish		Discount Mach. Screws	Stove Bolts
Cartons		19	33
Bulk	*Quantity*		
To ¼" diam. incl.	25,000-200,000	9	54
5/16 to ½" diam. incl.	15,000-100,000	9	54
All diam. over 3" long	5,000-100,000	—	54

Machine Screw & Stove Bolt Nuts

		Discount Hex	Square
In cartons		16	19
	Quantity		
In Bulk ⅜" diam. & smaller	15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham	119.0
New York	131.7
Chicago	134.1
San Francisco-L. A.	141.6

Dec. 1955 value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick

	Carloads per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$128.00
No. 1 Ohio	128.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	114.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	10.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$140.00
Childs, Hays, Pa.	145.00
Chicago District	150.00
Western Utah	144.00-165.00
California	170.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	150.00-157.00
Silica cement, net ton, bulk, Latrobe	26.50
Silica cement, net ton, bulk, Chicago	24.00
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	23.00
Silica cement, net ton, bulk, Utah and Calif.	35.00

Chrome Brick	*Per net ton*
Standard chemically bonded, Balt.	$98.00
Standards chemically bonded, Curtiner, Calif.	108.00
Burned, Balt.	92.00

Magnesite Brick

Standard, Baltimore	$121.00
Chemically bonded, Baltimore	109.00

Grain Magnesite	St. ⅜ to ½-in. grains
Domestic, f.o.b. Baltimore in bulk	$69.40
Domestic, f.o.b. Chewaiah, Wash., Luning, Nev. in bulk	43.00
in sacks	49.00

Dead Burned Dolomite	*Per net ton*
F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	$16.00
Midwest	16.35
Missouri Valley	16.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh

Swedish sponge iron f.o.b. Riverton, N. J., ocean bags	8.50¢
Canadian sponge iron, Del'd in East, carloads	9.5¢
Domestic sponge iron, 98+% Fe, carload lots	8.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0c
Carbonyl iron size 5 to 10 micron, 98%, 99.8+% Fe	86.0¢ to $1.55
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	37.50¢ to 50.00¢
Copper, electrolytic	49.75¢
Copper, reduced	49.75¢
Cadmium, 100-199 lb, 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe .03 max. Del'd	$5.00
Lead	8.90¢ plus metal value
Manganese f.o.b. Exton, Pa.	46.0¢
Molybdenum, 99%	$3.60 to $3.85
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder 7.0¢ to 9.0¢ plus met. value	
Stainless steel, 302	99.0¢
Stainless steel, 316	$1.32
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$4.20
Zinc, 10 ton lots	18.75¢ to 32.50¢

FERROALLOY PRICES

(Effective March 19, 1957)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C	41.50	0.20% C	38.50
0.03% C	41.00	0.50% C	38.25
0.06% C	39.50	1.00% C	37.50
0.10% C	39.00	1.50% C	37.35
0.15% C	38.75	2.00% C	37.25

4.00-4.50% C, 67.70% Cr, 1-2% Si .. 27.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.75
0.025% C (Simplex) 34.75
0.10% C, 50-52% Cr, 2% max Si .. 35.75
8.50% max. C, 60-55% Cr, 3-6% Si.. 24.00
8.50% C, 50-55% Cr, 3% max Si.... 24.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C $1.31
0.50% max. C 1.31
9 to 11% C, 33-91% Cr, 0.75% Fe... 1.40

Electrolytic Chromium Metal

Contract prices per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads $1.29
Ton lots 1.31
Less ton lots 1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.

Carloads 44.65
Ton lots 48.95
Less ton lots 51.45

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.

30-33% Cr, 60-65% Si, 3.00 max. Fe.
Carloads 25.65
Ton lots 27.95
Less ton lots 29.45

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.
Carloads 24.25
Ton lots 26.15
Less ton lots 27.15

5MZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots 20.15
Less ton lots 21.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots 17.20
Ton lots 18.70
Less ton lots 19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed 18.50
Ton lots to carload packed..... 19.65
Less ton lots 20.90

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.75
Johnstown, Pa.	12.75
Sheridan, Pa.	12.75
Philo, Ohio	12.75
S. Duquesne	12.75

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:
Carloads, bulk 14.80
Ton lots packed 17.20

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.
Carload, packed 45.75
Ton lots 47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads 33.00
Ton lots 35.00
250 to 1999 lb 37.00
Premium for Hydrogen-removed metal 0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn... 25.50

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.40
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si....	28.60	31.40	32.60

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk 12.80
Ton lots 14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet 14.10
Ton lots, packed 16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $100.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe	23.70	22.40
98% Si, 0.75% Fe	24.45	23.15

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk 7.70
Ton lots, packed 10.50

Electric Ferrosilicon

Contract prices, cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si	13.00	75% Si	16.80
65% Si	15.65	85% Si	18.50
	90% Si 19.90		

Ferrovanadium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

Openhearth 3.20
Crucible 3.30
High speed steel (Primos) 3.40

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Alsifer, 20% Al, 40% Si, 40% Fe.

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads ..... 10.65¢
Ton lots ..... 11.80¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound Contained Mo $1.28

Ferrocolumbium, 50-50%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots $6.90
Less ton lots 6.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd ton lots, 2-in. x D per lb con't Sb plus Ta..... $4.95

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth Pa., per pound contained Mo.. $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton..... $90.00
10 tons to less carload..... $110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb. contained Ti..... $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.50
Less ton lots..... $1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton.....$215.00

Ferrotungsten, ¼ x down, packed, per pounds contained W, ton lots delivered..... $3.15

Molybdic oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.33

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk lump..... 18.50¢
Ton lots, packed lump..... 20.50¢
Less ton lots..... 21.00¢

Vanadium oxide, 86-89% V_2O_5 contract, basis, per pound contained V_2O_5 ..... $1.38

Zirconium contract basis, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed ..... 27.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Baron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

2000 lb carload..... $5.50

Boriam, f.o.b. Niagara Falls,

Ton lots per pound..... 45¢
Less ton lots, per pound.... 50¢

Corboriam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5% f.o.b., Suspension Bridge, N. Y., freight allowed.

Ton lots per pound..... 14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.... 1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B ..... .85
14 to 19%..... 1.20
19% min. B..... 1.50

Grainal, f.o.b. Bridgeville, Pa., freight, allowed, 100 lb and over

No. 1 ..... $1.05
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots $1.46
Less ton lots..... 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots..... $2.15

RAILWAY EQUIPMENT

FOR SALE

Used - As Is - Reconditioned

RAILWAY CARS

All Types

SERVICE-TESTED

FREIGHT CAR REPAIR PARTS

For All Types of Cars

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Diesel, Steam, Gasoline, Diesel-Electric

SPECIAL OFFERING
50-TON CAPACITY GONDOLA CARS

Length—46'0" | Drop Ends
Steel Underframes | Steel Ends
Steel Sides | Wood Floor
AB Air Brakes

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6,000- 8,000- and 10,000-Gallon Cleaned and Tested

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"ANYTHING containing IRON or STEEL"

West Coast Dealers Are Hustling

Used machinery business there is good, but finding exactly what's wanted takes effort.

Buying by the new industries in the area should keep the market active all year.

▪ West Coast used machinery dealers have no time for leisure. In the three major Coast markets—Los Angeles, San Francisco, and Seattle—they're really active digging up every possible late-model machine in good condition. Although business is going great guns, it takes a lot of hustle to find exactly what the customers want.

One of the San Francisco Bay Area's largest dealers sums the market up in this way: "If northern California machinery customers buy only 60 pct of the equipment they say they'll need this year, it'll be a heck of a good year." Another official says his sales for the first two months of this year are up about 15 pct over the same period of 1956.

Summer Peak? — "We're only building up for the grand peak that should come about July or August." This San Francisco Bay Area bounce and optimism isn't based on a vague hope. After midyear, many of the large corporations that set up plants in this part of the state should become big shoppers. They'll be after specialized machinery.

Dealers feel that by midyear these new and expanding firms will be through with buying from the East. Then local buying will be in earnest.

Best Bets—Turret lathes, good milling machines, and punch presses don't catch dust in any dealer's storeroom. But radial drills, on the best seller list for a long time, are no longer in hot demand.

A stellar attraction in the Bay Area: vertical turret lathes. A 1942 model, which sold for about $14,000 new, now brings from $20,000 to $22,000 "without any trouble." Dealers in the area find clunkers are still pretty much of a drug.

Much of the demand is from the booming electronic industry. The industry's need is for good machinery to handle close tolerances.

Bay Area dealers see it this way: Even if sales in the rest of the country go into a slump, it isn't likely to happen on the Coast with all the new industry slated to be in the market this year.

Scouting East—In the Los Angeles area the picture is much the same. Late-model machinery is in heavy demand. Dealers are again scouting eastern markets for machines.

Even some very old stuff is moving. Buyers pick up old machines, take off the base, table, or some other part, and use it to make a single-purpose tool.

Toughest to Find—Hardest items to get in southern California: grinders, No. 4 and No. 5 mills, engine lathes 16 in. to 24 in. Sheet metal equipment goes like hot cakes, especially 10 gage and 12 gage.

Seattle used machinery customers also want only good-condition, late-model, and low-priced equipment. Local used machinery men report heavy springtime demand for all types of heavy lathe equipment and borers. The Puget Sound shipbuilding program shows signs of gradual expansion. That's good news for those who've held off purchases for some months.

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS
6' x 3/16" Niagara Initial Type
10' x ½" Kling Pyramid Type
30' x ⅜" Niles Pyramid Type
BRAKES—LEAF TYPE
8' x 3/16" Dreis & Krump
12' x ¼" Dreis & Krump
BRAKES—PRESS TYPE
12' x 5/16" Cincinnati—NEW
CRANES—OVERHEAD ELECTRIC TRAVELING
3 ton P&H 56' Span 220/3/60
5 ton R&M 40' Span 220/3/60 A.C. Floor Control—New 1955
5 ton Whiting 48' Span 230/3/60 A.C.
5 ton Shaw 56' Span 230 Volt D.C.
8 ton P&H 55' Span 220/3/60
10 ton P&H 38' Span 230 Volt D.C.
10 ton R&M 40' Span 220/3/60 A.C.
15 ton P&H 48' Span 230 Volt D.C.
25 ton Cleveland 70' Span 230/3/60 A.C. With 10 ton Auxiliary
DRAW BENCH
10,000# Aetna Standard. Length of Draw 44'. Used to draw S.A.E. 1035 Welded Steel Tubing
FORGING MACHINES
1" to 5" Acme, Ajax, National
3" Acme Model XN, Air Clutch, NEW 1954
HAMMERS—BROAD DROP—STEAM DROP—STEAM FORGING—800 lb. to 20,000 lb.
LEVELER—STRETCHER
100 ton Hydr. Stretcher Leveler. Capy. .032" Ga. 36" Width, 96" Length; 4 Sheets in a Pack
LEVELLERS—ROLLER
37" Torrington, 19 Rolls 1-31/32" Dia. Backed up
48" Aetna Standard, 17 Rolls 3¾" Dia.
54" McKay, 17 Rolls, 3⅝" Dia.
108" American, 17 Rolls, 4½" Dia.
PLANER—PLATE EDGE
35" Southwark Pneumatic Holddown, Motor Driven, Capacity 1½"
PRESSES—HYDRAULIC
200 ton Bliss Hydro Dynamic, 36" Stroke Bed Area 36" x 31"
2800 ton Bliss Hydro Dynamic, 12" Stroke, 60-15/16" Between Columns
4500 Baldwin-Lima-Hamilton Hydr. Forging Press
PRESSES—STRAIGHT SIDE
Bliss #80 300 ton, 16" Stroke, Bed 44" x 83"
Clearing F-1300-42, 300 ton, 24" Stroke, Bed 44 x 36"
Bliss #1018 Toggle Drawing 1550 ton, Inner Stroke 24", Outer 12", Die Space 60" x 72"
PRESSES—TRIMMING
#56 Bliss Cons., 5" Stroke, 26" Bet. Ups
#73½ Bliss 3" Stroke, 18" Bet. Ups
#76½ Bliss 4" Stroke, 27" Bet. Ups
PUNCH & SHEAR COMBINATIONS
Cleveland Style EF Single End, 42" Throat
Cleveland Style G Single End, 60" Throat
Cleveland Style W, 60" Throat
No. 1½ Buffalo Universal Ironworker
ROLLS—FORMING
11 Stand Dahlstrom Roll Forming Mach. With Flying Pre-Notch Press & Flying Shear. Will take widths up to 8"
ROLLING MILLS
9" Bar Mille
18" Three High Bar Mill
10" x 14" Single Stand Two High
12" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 24" Farrel Two Stand Two High
26" x 72" Cold Rolling Mill
44" x 144" Three High Sheet Mill
22" x 40" Three High Sheet Mill
SHEARS—ALLIGATOR
No. 4 Mesta RH LK, Capacity 2" x 12"
SHEARS—BAR
No. 12 Buffalo Armor Plate
Capacity 5" to 15" Beams & Channels
SHEARS—SQUARING
6" x 10" Ga. Niagara No. 672
62" x ¼" Peck Stow & Wilcox
8' x ¼" Niagara—NEW 1952
10' x ⅝" Niagara—NEW 1950
12' x ½" Cincinnati
SLITTERS
25" Blake & Johnson
36" Wean Slitting Line
36" Paxson Slitting Line
STRAIGHTENER
Kane & Roach Type B, Capy. ⅞" Hex. Flat 4" x 11/32" Flat & Edge 1⅞" x 3/16"
SWAGING MACHINE
#6½A Fen. Capacity 2¼" Tube 3¾" Solid 10" Die Length Hydraulic Feed. LATE
TESTING MACHINES
20,000# Baldwin Universal Hydraulic
60,000, 100,000, 200,000 Olsen & Riehle Universal
50,000 and 300,000 lb Compression
TUBE MILL
Etna 1K Welded Tube Mill, Cut-off & Transformer Capy. ½" OD 0.28 wall to 2" OD .120 wall
WIRE MACHINERY
Waterbury Type Straight Roll Tub Type 16 die Fine Wire Drawing Machine

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ELECTRIC POWER EQUIPMENT
DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	2200	G.E.	MCF	600	400/500
3	1375	G.E.	MCF	415	1300
1	1000	G.E.	MCF	600	350/700
1	940	Whse.	QM	250	140/170
1	800	Whse.		390	250/550
		With United Gear Set 7:1 Ratio			
1	500	Whse.	CC-216	600	300/900
3	450	Whse.		550	415
2	300	G.E.	MPC	230	400
1	250	G.E.	MPC	230	400/600
1	200	Whse.	CB-5113	250	400/800
2	200	Whse.	CB-207.4	250	850/1200
1	150	G.E.	CD B.B.	600	250/700
1	150	Cr.Wh.	65-H	230	1150
2	125	Whse.	SK-185	230	350/1050
1	125	Whse.	SK-183	230	850
2	100	Whse.	SK-181	230	450/1000
1	60/100	G.E.	RF-17	230	450/900
2	75	Cr.Wh.	53H TEFC	230	860
1	50	G.E.	MD-412-AE	230	550
6	40	Rel.	385F TEFC BB	230	500/1500
2	30/40	Whse.	SK-131.5-BB DP	230	500/1500

MG SETS — 3 Ph. 60 Cy.

Qu.	KW	Make	RPM	DC Volts	AC Volts
2	2000/2400	G.E.	450	250/300	2300/4600
1	2000	G.E.	500 25 cy.	660	11000
1	2000	G.E.	514	600	2300/4600
1	1500	G.E.	720	600	6600/13200
3	1000	G.E.	720	600	6600/13200
2	1000	G.E.	514	600	6600/13200
1	750	G.E.	720	125/250	2300/4600
1	500	G.E.	900	540/540	4150
1	500	Whse.	900	125/250	440
2	300	G.E.	1200	250	2300
2	300	Whse.	1200	275	440/2300
1	200	Whse.	1200	550	2300

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
1	3000	A.C.	OISC	3	33000 x 2300
1	1500	G.E. auto	HT	3	4000/4200/4400
3	1000	G.E.	HVDDJ	1	2400 x 480
3	1000	G.E.	OA/FA	1	13800 x 230/460
1	833	G.E.	H	1	13800 x 460
2	750	G.E.	Pyranol	1	4800 x 85/55
3	500	Kuhl.	OISC	1	13200 x 6600
1	500	G.E.	OISC	1	13200 x 2300
1	500	G.E.	HS	1	13800 x 600
1	300	G.E.	HT	3	4160 x 480/277
3	250	L.M.	OISC	1	13800 x 240/120
1	200	G.E.	AirCooled	3	432/480 x 120/208Y
3	150	G.E.	OISC		33000 x 2300-4000Y

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2000# Chambersburg Pneumatic Forging Hammer, Late Type, Serial 20CH392L7.
2" Wallace Hydraulic Pipe Bender
6' Carlton Radial Drill, 17" column
No. 7 Ajax Forging Press, 700-ton capacity
3—2-ton Denison Auto. Hopper Feed & Index Table Hydr. Multipress
25 Transformer and Generating Arc Welders
2500 lb. Model E Chambersburg Steam Drop Hammer, New 1944
3000 lb. Model J-2 Chambersburg Board Drop Hammer, Motor driven head
1000 lb. Model J-2 Chambersburg Board Drop Hammer, Motor driven head
4" National High Duty Upsetting & Forging Machine, air clutch, also one with regular clutch, also 1", 2", 3" air clutch
Williams White Bulldozers from 5-ton to 300-ton
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Single & Double End Punches
No. 3 Motch & Merryweather Saw, with Saw Grinder

BOLT, NUT AND RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES.

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REBUILT — GUARANTEED ELECTRICAL EQUIPMENT

COMPLETE PACKAGE MILL DRIVE IN STOCK
(1)—800-HP., Whse. motor, 168 R.P.M., 710 VDC, sep. excited fields
(1)—720/850-KW Whse. M-G Set, 600/710 VDC, Diff. Comp. driven by a synchronous motor 900 R.P.M., 4000/2300,-volt, 3 phase, 60 cycle.
(1)—Starting panel for syn. motor
(1)—4 unit exciter set
(1)—Set of variable voltage control

IDEAL REEL DRIVES
(2)—600-HP Allis-Chalmers mill motors, 600-VDC, 300/600 R.P.M., with a 1200-KW, 600-VDC Westinghouse M-G Set, 1750-HP synchronous motor, 4160/2300-Volt, 3 phase, 60 cycle.
(2)—275-HP Westinghouse mill type motors, 230-Volt, 425/850 R.P.M., with 2 or 3-unit, 600-KW M-G Set, 250-VDC and 900-HP synchronous motor, 2300-Volt, 3 phase, 60 cycle.
(2)—100-HP Electro-Dynamic motors, 230-VDC, 450/1350 R.P.M., with 3-unit, 300-KW Allis-Chalmers M-G Set, 2300/440-Volt, 3 phase, 60 cycle.

SPECIAL
(2)—600-HP Westinghouse mill motors, 230-VDC, 110/220 R.P.M., anti-friction pedestal bearings.

MOTOR GENERATOR SETS

Qu.	KW	Make	RPM	DC Volts	AC Volts
1	1500	G.E.	514	250	4000/2300
3	1000	Whse.	720	250	2300
2	500	Whse.	1200	125/250	2300
1	400	G.E.	1200	250/275	2300
1	800 (3-unit)	Al. Ch.	1200	250/300	2300
3	200	Whse.	1200	125/250	2300
2	150	Rel.	1200	125	2200
2	150	Whse.	1200	125/250	2300
1	150	G.E.	1200	250	4600/2300
1	100	Al. Ch.	1200	250	4600/2300
1	100	Whse.	720	125/250	2200
1	75	Whse.	1200	125/250	2200

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NEW BATH PRESS BRAKES
10' x ¼" No. 150-10, 150 ton, 12' bed
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10' x 8 ga. No. 100-10, 100 ton, 12' bed
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3" Gleason Str. Line Bevel Gens.
No. 2 Dalzen Thread Grinder with dresser.
No. 4 Fellows Gear Shavers.
No. 2A W & S Bar Mach., 1935.
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1—28" REVERSING BREAKDOWN MILL.
1—25" & 42" x 60" HOT STRIP MILL, 4-high.
1—28" PINION STAND, 2-high, modern design.
1—16" x 24" COLD MILL, 1 stand.
1—8" x 10" COLD MILL, 2-high; roller bearings, coil box; recoiler; D.C. variable speed drive.
1—5" x 4" COLD MILL, 2-high; roller bearings; coil box coiler; D.C. drive.
1—4" x 6" 2-HIGH COLD MILL, 5 HP motor, extra rolls.
1—18" BAR MILL, 3-high, single stand, with motor and gear reducer.
1—10" ROD MILL.
3—MECHANICAL COOLING BEDS for bars, 150 ft. and 120 ft. long.
1—ROLL FORMING MACHINE, Kane & Roach, for .072" x 5¾" wide stock.
1—COIL-UP-AND-DOWN ENDER for 54" dia. x 44" wide coils.
1—34" x 192" ROLL GRINDERS with motors and controls.
1—44" ROLL LATHE, enclosed headstock, tailstock, piano rest, 20 HP 500/1500 RPM, 230 volts D.C. motor and controls.
2—ROLLER LEVELERS, McKay, rolls 80" face x 5¼" dia., with gear box and universal spindles.
1—STRETCHER LEVELER for sheets, 500,000 lb. capacity.
1—KANE & ROACH BAR AND ANGLE STRAIGHTENER, size #5, cap. 4" x 4" x ½" angles, 5" channels, 2½" bars.
2—KANE & ROACH BAR AND ANGLE STRAIGHTENER, size #4, cap. 3" x 3" x 5/16" angles, 3½" channels and 2" bars.
1—#1 MEDART STRAIGHTENER, capacity ½" to 2½" bars, tubes, extra rolls.
3—PICKLING MACHINES for sheets, Mesta.
1—SCRUBBER AND DRYER for sheets 66" wide.
2—PACK FURNACES for hot sheet mills, 62" x 60', double chamber.
1—LOCOMOTIVE, 62½ ton Diesel Electric.
2—UNITED HOT SAWS, 50", sliding frame.
1—BONNOTT BILLETEER, size "A", cap. 3" to 6" Squares.
1—UNITED #4 BAR SHEAR, vertical open side.
1—PELS BILLET AND BAR SHEAR, cap. 7" round, 50 HP motor.
1—CRACKER SHEAR, AETNA-STANDARD, 2½" bars.
1—WILLIAMS & WHITE bar shear, cap. 1¼" sq.
1—ROTARY SIDE TRIMMING SHEAR, capacity 112" x ⅝" plate.
1—192" x 10 GAUGE NIAGARA SQUARING SHEAR, little used.
1—150"x ¼" SHEET SQUARING SHEAR.
1—120" x 10 GAUGE WYSONG & MILES SQUARING SHEAR.
1—SLITTING SHEAR FOR SHEETS, Mesta 92".
1—FLYING SHEAR, capacity ⅛" thick x 36" wide in lengths from 2½ ft. to 12 ft.
1—150" BRIDGEPORT SHEAR KNIFE GRINDER.
1—ALLIANCE LADLE CRANE, 4 girders, 80 ton main hoist, 25 ton auxiliary, 55'5" span, 42' lift.
1—DRAWBENCH, Mesta, oil-hydraulic, for 3 strands of bars 20' long.
1—66" GALVANIZING LINE for sheets, with 2 roller levelers.
1—TOLEDO DIAL SCALE, 12500 lb. capacity, 92" x 71" steel platform.
3—LIFT TRUCKS, 5-ton Elwell-Parker.
1—3500 HP GEAR DRIVE, 514 to 80 RPM, 6.45 to 1 ratio.
1—2000 HP GEAR DRIVE, 200/580 RPM input, 4.44 to 1 ratio.
1—1600 HP GEAR DRIVE, 514 to 87 RPM, 5.9 to 1 ratio.
1—1200 HP GEAR DRIVE, 353 to 94.6 RPM, 3.73 to 1 ratio.
1—500 HP GEAR DRIVE, 514 to 100 RPM, 5.14 to 1 ratio.
1—3500 HP MOTOR, 11000 volts, 3 phase, 60 cycle, 514 RPM.
1—1200 HP MOTOR, 2200 volts, 3 phase, 60 cycle, 353 RPM.
1—500 HP MOTOR, 2200 volts, 3 phase, 60 cycle, 514 RPM.
1—MC-30 WEST. MOTOR, 230 V. D.C. back axle brackets and shaft.
1—MC-20 WEST. MOTOR, 230 V. D.C. back axle brackets and shaft.
1—RAIL BREAKER, Williams & White, capacity 130 lb. rails.

FRANK B. FOSTER, INC.

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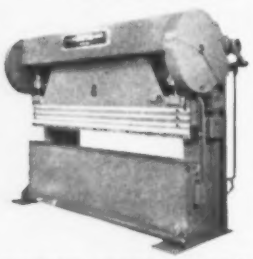
Cable: "Foster, Pittsburgh" Telephone ATlantic 1-2780

IMMEDIATE DELIVERY
BRAND NEW

CYRIL BATH

(STURDYBENDER)



POWER PRESS BRAKES

#100- 8	8' x 3/16"	10' Bed
#100-10	10' x 8 GA.	12' Bed
#150- 8	8' x 5/16"	10' Bed
#150-10	10' x 1/4"	12' Bed
#150-12	12'x3/16"	14' Bed

Purchasers of Cyril Bath Brakes are entitled to services of a factory representative to assist and supervise installation, and instruct personnel in operation and maintenance. NO CHARGE FOR THIS SERVICE.

PRESS & SHEAR MACHINERY CORP.
2600 EAST TIOGA STREET
PHILADELPHIA 34, PA.
GArfield 6-8840

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13"x48" centers Pratt & Whitney Geared Head, m.d.
13"x42" centers LeBlond "Regal," m.d.
14"x32" centers Cincinnati Geared Heat, m.d., late
14"x30" Lodge & Shipley, m.d.
14"x37½" centers American, m.d.
14"x6' Lodge & Shipley Geared Head, m.d.
14"x6' Pratt & Whitney, cone
14"x6' LeBlond, cone
14"x6' LeBlond, Geared Head, s.p.d.
14"x6' bed Monarch, cone, motorized
14"x6' Sidney Geared Head, m.d.
14"x6' Springfield Geared Head, m.d., taper
16"x30" centers Monarch, m.d., taper
16"x54" centers Sidney, m.d.
16"x54" Boye & Emmes m.d.
16"x6' Hendey Geared Head, m.d.
16"x6' Hendey Yoke Head, m.d., taper
16"x6' Lehmann Geared Head, m.d.
16"x6' Lodge & Shipley Selective Head, m.d.
16"x6' Bed Monarch Geared Head, m.d.
17"x6' LeBlond Geared Head, m.d.
18"x48" centers Lodge & Shipley Geared Head, m.d.
18"x6' American, 8 speed, m.d.
18"x6'6" Greaves-Klusman Geared Head, m.d.
18"x8' bed American Geared Head, m.d.
18"x8' Hendey Geared Head, m.d., taper
18"x8' Lodge & Shipley Geared Head, m.d.
18"x96" Sidney, m.d.
18"x106" American, m.d.
18"x10'6" bed Boye & Emmes, cone, motorized
19"x8' bed LeBlond Geared Head, Timken, m.d.
19"x10' bed LeBlond Geared Head, m.d.
20"x48" centers Boye & Emmes, m.d.
20"x72" centers Monarch Geared Head, m.d.
20"x70" centers American, m.d.
20"x8' bed Lodge & Shipley Geared Head, m.d.
20"x8' bed Greaves-Klusman Geared Head, m.d. in leg
20"x8' bed Boye & Emmes, m.d.
20"x10' Sidney Geared Head, m.d.

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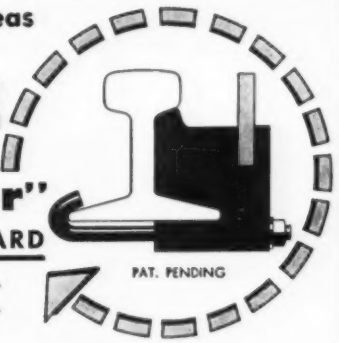

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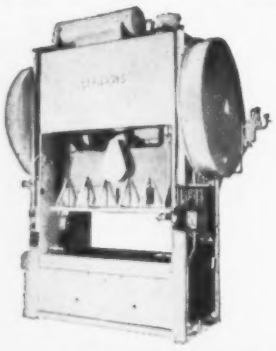

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Are you
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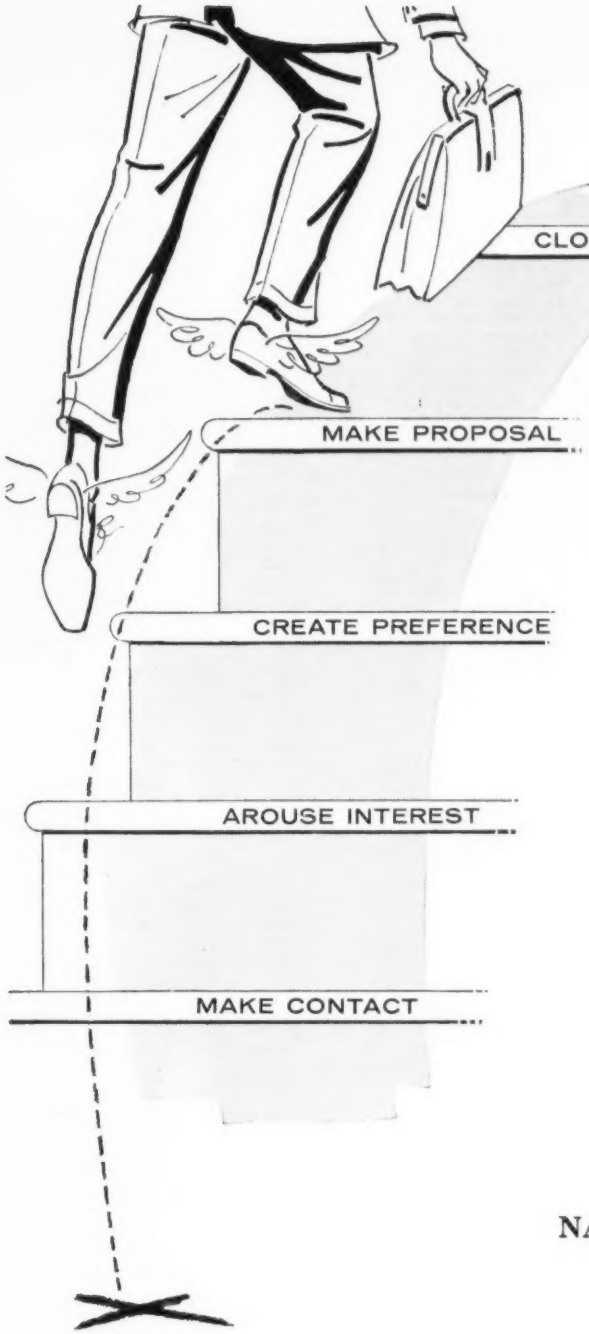
of
THE IRON AGE



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METALWORKING BRIEFS

One Strike Settled, Two Continue

A week-old strike of 1700 workers was settled at U. S. Steel's Tennessee Coal & Iron Div. ore mines and sintering plants at Birmingham, Ala. The workers walked out in protest to company disciplinary action against several employees who "refused to carry out assigned jobs." Meanwhile, two other strikes in the Birmingham area continued. They are at Woodward Iron Co., which began last Nov. 1, and at U. S. Steel's Union Supply Co. stores.

Linde Opens Struck Plant

The struck Linde Air Products Co. plant at Kittanning, Pa., was reopened. Production rate of half normal capacity is being carried on by 25 supervisory personnel, the company said. The plant normally employs 160. It is the second Linde oxygen plant to go into production since the strike began earlier this year. The other is at Essington, Pa.

Wildcat Walkout Slows Gary Output

Negotiators were working around the clock to settle a wildcat strike of 3000 workers at U. S. Steel's giant Gary Works. The strike started March 14, apparently in response to overtime cuts among servicing and maintenance personnel. Earlier this week it was expected that three openhearths would be shut down and a total of 4000 workers idled if quick settlement was not effected.

U.S. May Back New Kaiser Mill

Kaiser Aluminum & Chemical Corp. officials are reported in a huddle with government finance men over details of a 100,000-ton aluminum mill Kaiser wants to build in Brazil. Observers are betting Kaiser will borrow money from U. S. banks with the government guaranteeing the loan.

No Oxygen; Republic Shuts Two Furnaces

Republic Steel Corp. took two openhearths out of production in Cleveland because the shortage of industrial oxygen has halted all home scrap preparation. Some mills are reported using old air hammers for scarfing operations.

Defense Pie Sliced Thinner

The share of military procurement contracts going to small business dropped from 19.6 pct to 16.4 pct in 1956, the Defense Dept. reports.

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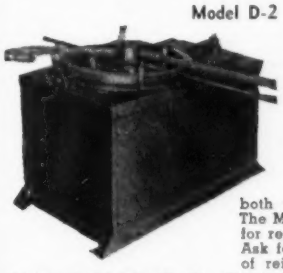
KARDONG FOUR-WAY BENDER
For Concrete Reinforcing Steel

Model D-2



The Model D-2 Kardong Bender is a Four Direction Horizontal Bender. With this bender it is not necessary to turn bars over to make reverse or second bends on beam bars. The Model D-2 is made in two sizes. Model D-2 Standard 6-inch, which will bend bars around collars 2-inch to 6-inch and Model D-2 Special 8-inch, which will bend bars around collars 2-inch to 8-inch. Capacity of both models, 1¼-inch Square Bars. The Model D-2 is a production bender for reinforcing steel fabricating shop. Ask for catalog of our complete line of reinforcing bar benders.

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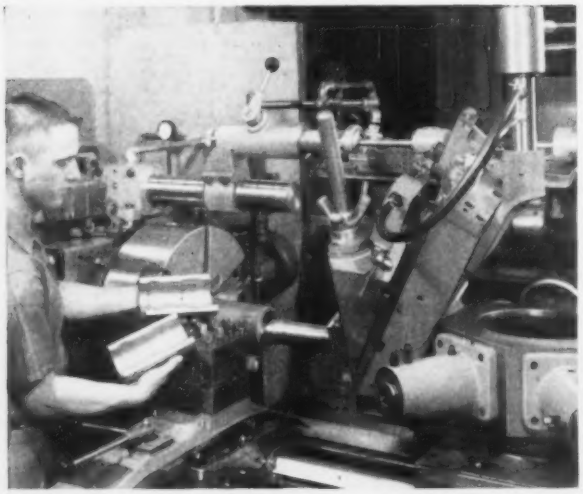
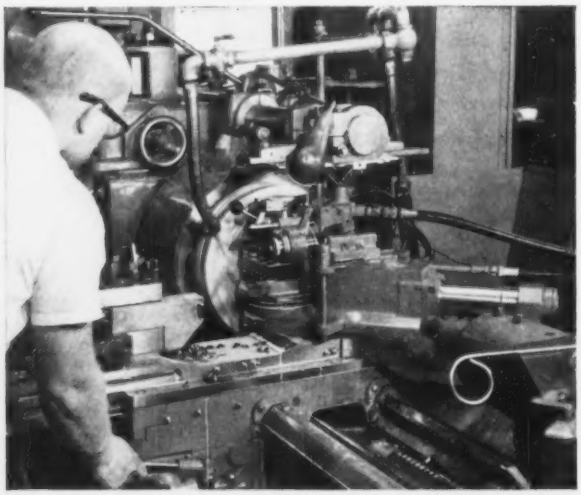


NEW WARNER & SWASEY HEXAGON TURRET CONTOURING SLIDE TOOLS—Exclusively designed for contour boring work.

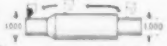
Available on No. 5 Ram Type and 2-A, 3-A and 4-A Saddle Type Turret Lathes.



WARNER & SWASEY CROSS SLIDE CONTOUR ATTACHMENTS—The only turret lathe contour attachments that give you both *contour turning* and *cross center contour facing* in one unit.

There is a difference in contour attachments

ON WARNER & SWASEYS, the difference is BASIC CONTROL. Translating the touch of the tracer stylus on the template to a precise, powerful cutter feed on the workpiece is the job of the "Micro-Sensitive" control arrangement used on all Warner & Swasey contour devices. A unique flexure-pivoted stylus and an instrument-quality hydraulic control valve provide unmatched sensitivity, fast response, and accuracy in the action of the contour units.

These controls eliminate lost motion, assure precise return of the cutter for exact machining of identical diameters that are separated like this: 

Ninety-degree faces like this are made flat and square, properly located longitudinally on the part without need for compensations in the template form—template and part contours are exact duplicates.

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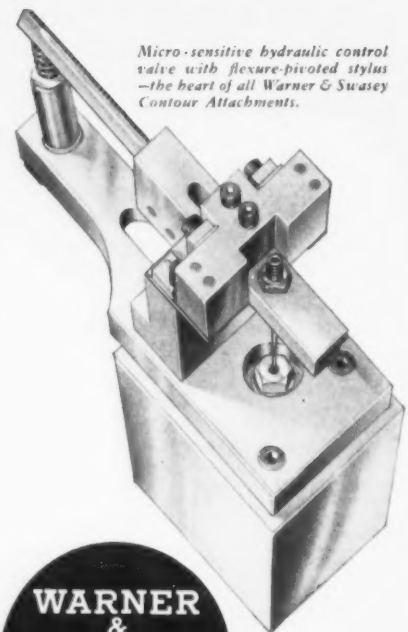

Micro-sensitive hydraulic control valve with flexure-pivoted stylus —the heart of all Warner & Swasey Contour Attachments.

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PRECISION MACHINERY SINCE 1880

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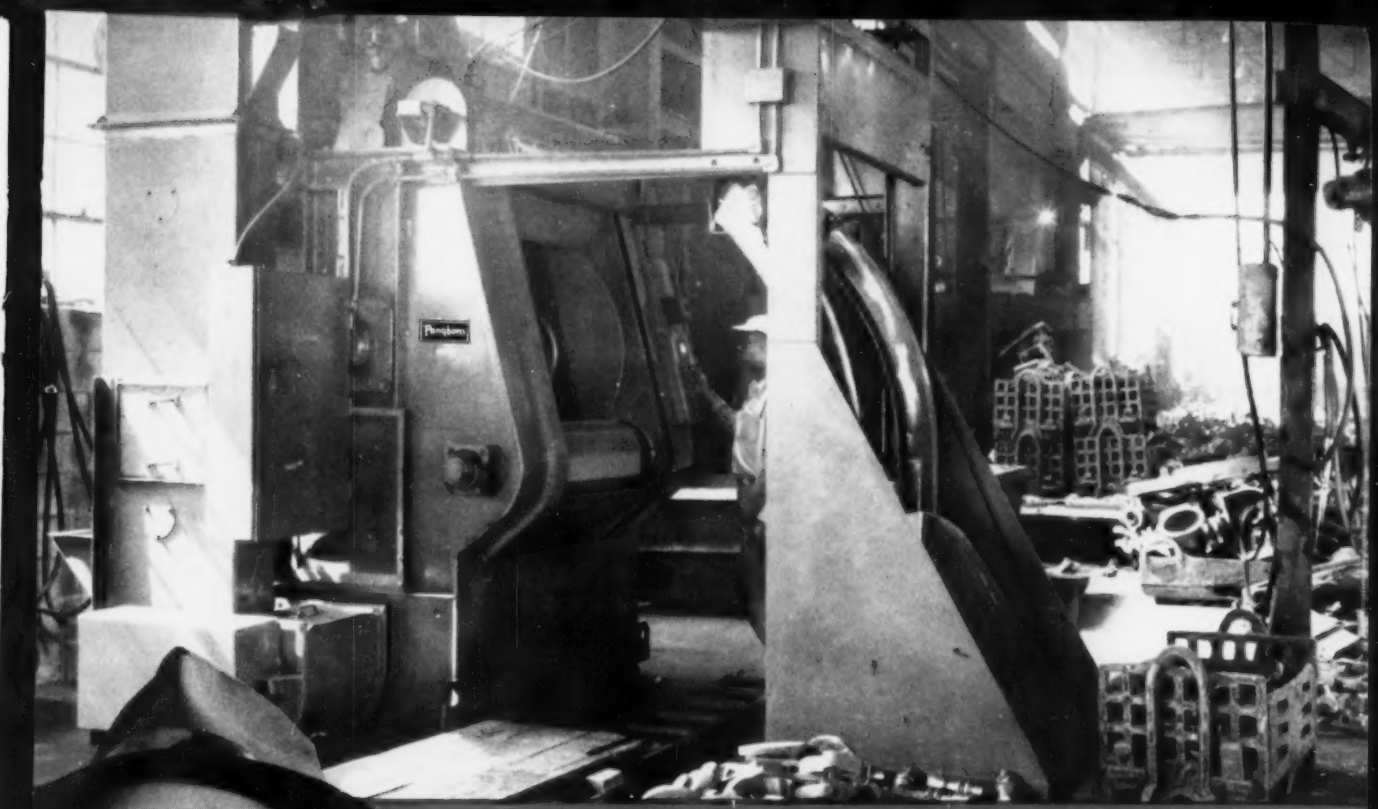

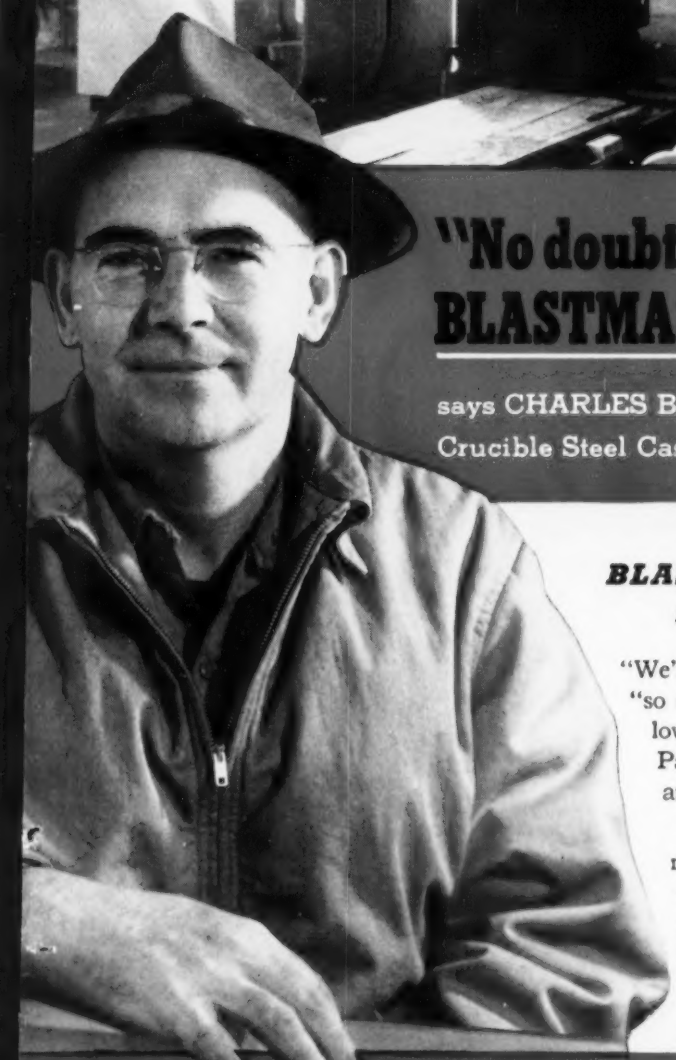

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says CHARLES BACHMAN, Plant Engineer,
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TIMKEN® bearings put squeeze on costs

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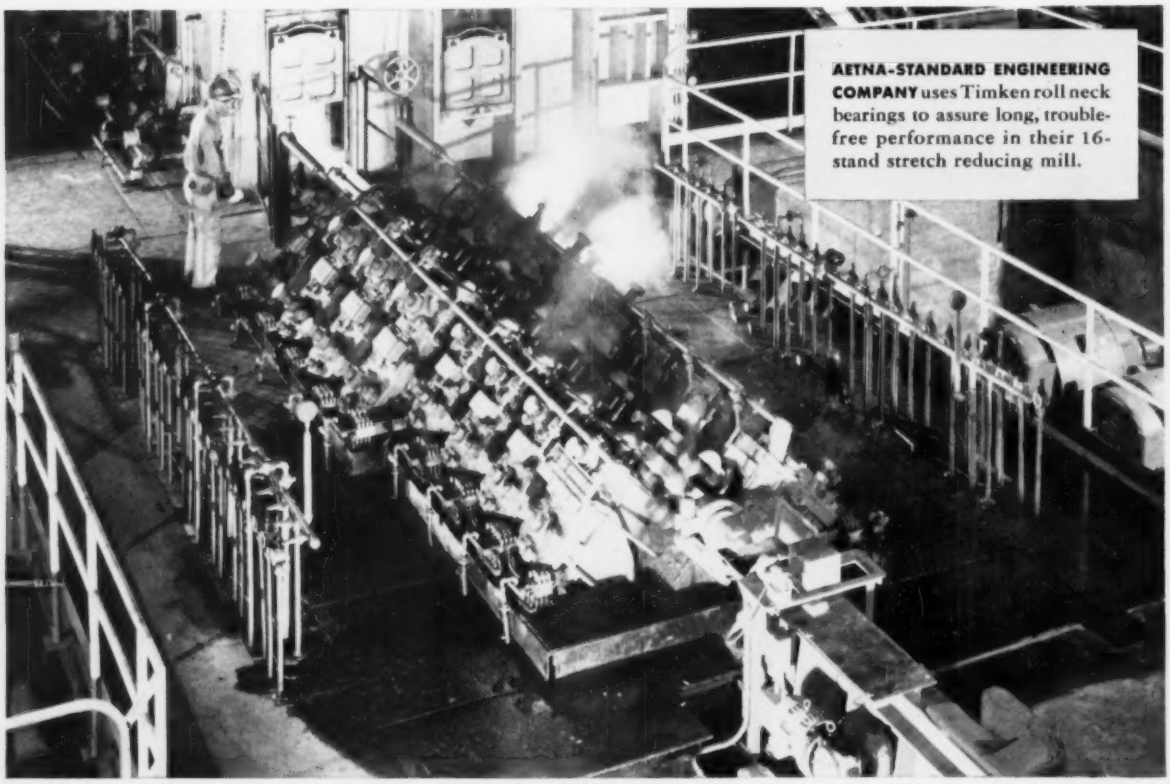
This symbol on a product means its bearings are the best.



AETNA-STANDARD ENGINEERING COMPANY uses Timken roll neck bearings to assure long, trouble-free performance in their 16-stand stretch reducing mill.

TIMKEN *TAPERED ROLLER BEARINGS ROLL THE LOAD*

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